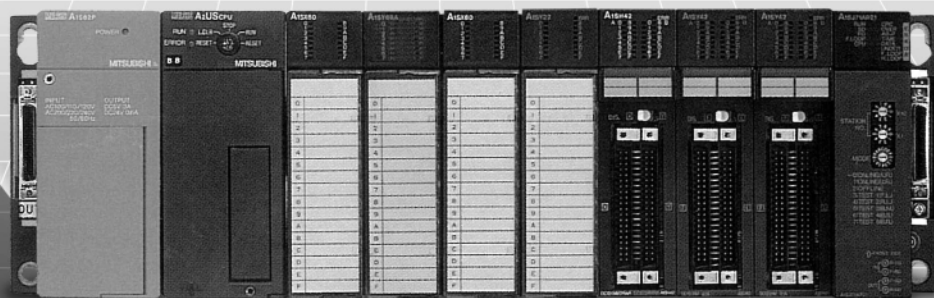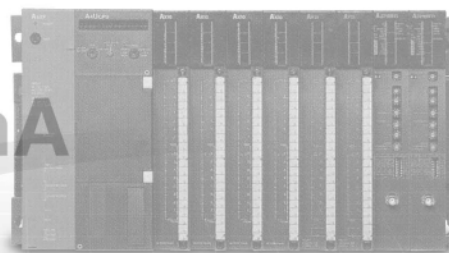# MITSUBISHI

Mitsubishi Programmable
Logic Controller

Transition from MELSEC-A/QnA Large Type

Series to AnS/Q2AS Small Type Series Handbook

MELSEC-A/QnA

MELSEC-AnS/Q2AS

● SAFETY PRECAUTIONS ●

(Be sure to read these instructions before use.)

Before using the product, read this and relevant manuals carefully and handle the product correctly with full attention to safety.

In this manual, ●SAFETY PRECAUTIONS● are classified into 2 levels: "DANGER" and "CAUTION".

⬦DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury and/or property damage.

Under some circumstances, failure to observe the ⚠CAUTION level instructions may also lead to serious results.

Be sure to observe the instructions of both levels to ensure the safety.

Please keep this manual in a safe place for future reference and also pass this manual on to the end user.

[Design Precautions]

⬦ DANGER

● Create a safety circuit outside the PLC to ensure the whole system will operate safely even if an external power failure or a PLC failure occurs. Otherwise, incorrect output or malfunction may cause an accident.

(1) For an emergency stop circuit, protection circuit and interlock circuit that is designed for incompatible actions such as forward/reverse rotation or for damage prevention such as the upper/lower limit setting in positioning, any of them must be created outside the PLC.

(2) When the PLC detects the following error conditions, it stops the operation and turn off all the outputs.

 • The overcurrent protection device or overvoltage protection device of the power supply module is activated.

 • The PLC CPU detects an error such as a watchdog timer error by the self-diagnostics function.

 In the case of an error of a part such as an I/O control part that cannot be detected by the PLC CPU, all the outputs may turn on. In order to make all machines operate safely in such a case, set up a fail-safe circuit or a specific mechanism outside the PLC. For a fail-safe circuit example, refer to "LOADING AND INSTALLATION" in the User's Manual of the relevant CPU.

(3) Depending on the failure of the output module's relay or transistor, the output status may remain ON or OFF incorrectly. For output signals that may lead to a serious accident, create an external monitoring circuit.

[Design Precautions]

◇ DANGER

● If load current more than the rating or overcurrent due to a short circuit in the load has flowed in the output module for a long time, it may cause a fire and smoke. Provide an external safety device such as a fuse.

● Design a circuit so that the external power will be supplied after power-up of the PLC.
Activating the external power supply prior to the PLC may result in an accident due to incorrect output or malfunction.

● For the operation status of each station at a communication error in data link, refer to the respective data link manual.
Otherwise, incorrect output or malfunction may cause an accident.

● When controlling a running PLC (data modification) by connecting a peripheral device to the CPU module or a PC to an intelligent/special function module, create an interlock circuit on sequence programs so that the whole system functions safely all the time.
Also, before performing any other controls (e.g. program modification, operating status change (status control)), read the manual carefully and ensure the safety.
In these controls, especially the one from an external device to a PLC in a remote location, some PLC side problem may not be resolved immediately due to failure of data communications.
To prevent this, create an interlock circuit on sequence programs and establish corrective procedures for communication failure between the external device and the PLC CPU.

● When setting up the system, do not allow any empty slot on the base unit.
If any slot is left empty, be sure to use a blank cover (A1SG60) or a dummy module (A1SG62) for it.
When using the extension base unit, A1S52B, A1S55B, A1S58B, A1S52B(S1), A1S55B(S1) or A1S58B(S1), attach the included dustproof cover to the module in slot 0.
Otherwise, internal parts of the module may be flied in the short circuit test or when an overcurrent or overvoltage is accidentally applied to the external I/O section.

⚠ CAUTION

● Do not install the control lines or communication cables together with the main circuit or power lines, or bring them close to each other.
Keep a distance of 100mm or more between them.
Failure to do so may cause malfunctions due to noise.

● When an output module is used to control the lamp load, heater, solenoid valve, etc., a large current (ten times larger than the normal one) may flow at the time that the output status changes from OFF to ON. Take some preventive measures such as replacing the module with the one of a suitable current rating.

[Installation Precautions]

⚠ CAUTION

● Use the PLC under the environment specified in the user's manual.

Otherwise, it may cause electric shocks, fires, malfunctions, product deterioration or damage.

● Insert the module fixing projection into the fixing hole in the base unit to mount the module, and tighten the module fixing screws with the specified torque.

Even correct mounting may cause malfunctions, a failure or a drop of the module if no screw is tightened.

Tightening the screw excessively may damage the screw and/or the module, resulting in a drop of the module, a short circuit or malfunctions.

● Connect the extension cable to the connector of the base unit or module.

Check for incomplete connection after installing it.

Poor electrical contact may cause incorrect inputs and/or outputs.

● Insert the memory cassette and fully press it to the memory cassette connector.

Check for incomplete connection after installing it.

Poor electrical contact may cause malfunctions.

● Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.

Failure to do so may damage the module.

● Do not directly touch the conductive part or electronic components of the module.

Doing so may cause malfunctions or a failure of the module.

[Wiring Precautions]

⬦ DANGER

● Be sure to shut off all phases of the external power supply used by the system before wiring.
Failure to do so may result in an electric shock or damage of the product.

● Before energizing and operating the system after wiring, be sure to attach the terminal cover supplied with the product.
Failure to do so may cause an electric shock.

[Wiring Precautions]

⚠ CAUTION

● Ground the FG and LG terminals correctly.
Failure to do so may cause an electric shock or malfunctions.

● Wire the module correctly after confirming the rated voltage and terminal layout.
Connecting a power supply of a different voltage rating or incorrect wiring may cause a fire or failure.

● Do not connect multiple power supply modules to one module in parallel.
The power supply modules may be heated, resulting in a fire or failure.

● Press, crimp or properly solder the connector for external connection with the specified tool.
Incomplete connection may cause a short circuit, fire or malfunctions.

● Tighten terminal screws within the specified torque range.
If the screw is too loose, it may cause a short circuit, fire or malfunctions.
If too tight, it may damage the screw and/or the module, resulting in a short circuit or malfunctions.

● Carefully prevent foreign matter such as dust or wire chips from entering the module.
Failure to do so may cause a fire, failure or malfunctions.

[Startup and Maintenance Precautions]

⬦!DANGER

● Do not touch any terminal during power distribution.

Doing so may cause an electric shock.

● Properly connect batteries.

Do not charge, disassemble, heat or throw them into the fire and do not make them short-circuited and soldered.

Incorrect battery handling may cause personal injuries or a fire due to exothermic heat, burst and/or ignition.

● Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screws or module mounting screws.

Failure to do so may result in an electric shock.

If they are too loose, it may cause a short circuit or malfunctions.

Tightening the screw excessively may damage the screw and/or the module, resulting in a drop of the module, a short circuit or malfunctions.

[Startup and Maintenance Precautions]

⚠CAUTION

● When performing online operations (especially, program modification, forced output or operating status change) by connecting a peripheral device to the running CPU module, read the manual carefully and ensure the safety.

Incorrect operation will cause mechanical damage or accidents.

● Do not disassemble or modify each of modules.

Doing so may cause failure, malfunctions, personal injuries and/or a fire.

● When using a wireless communication device such as a mobile phone, keep a distance of 25cm (9.84inch) or more from the PLC in all directions.

Failure to do so may cause malfunctions.

● Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.

Failure to do so may result in failure or malfunctions of the module.

● When replacing the fuse, use a fuse specified by the manufacturer.

Using the one for the high-rated current or an electric wire may cause a fire.

[Startup and Maintenance Precautions]

⚠ **CAUTION**

● Do not drop or apply any impact to the battery.

Doing so may damage the battery, resulting in electrolyte spillage inside the battery.

If any impact has been applied, discard the battery and never use it.

● Before handling modules, touch a grounded metal object to discharge the static electricity from the human body.

Failure to do so may cause failure or malfunctions of the module.

[Disposal Precautions]

⚠ **CAUTION**

● When disposing of the product, treat it as an industrial waste.

[Transportation Precautions]

⚠ **CAUTION**

● When transporting lithium batteries, make sure to treat them based on the transportation regulations.
(Refer to the User's Manual of each CPU for details of the relevant models.)

REVISIONS

Print Date	* Handbook Number	Revision	A - 9
May, 2006	L(NA)-08064ENG-A	First edition	

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1 INTRODUCTION

1.1 Suggestions for Transition from Large-sized A/QnA Series to Small-sized AnS/Q2AS Series

1.1.1 Concepts for alternative models

For transition from large-sized A/QnA series to small-sized AnS/Q2AS series, the A2USHCPU-S1, Q2ASCPU-S1 or Q2ASHCPU-S1 is suggested as an alternative model.
Consider adopting the Q series when transition to the A2USHCPU-S1, Q2ASCPU-S1 or Q2ASHCPU-S1 is difficult for the following reasons: the number of extension stages used is two or more, the I/O points used is 1024 or more, the program capacity exceeds 60K steps, etc.

Alternative models suggested
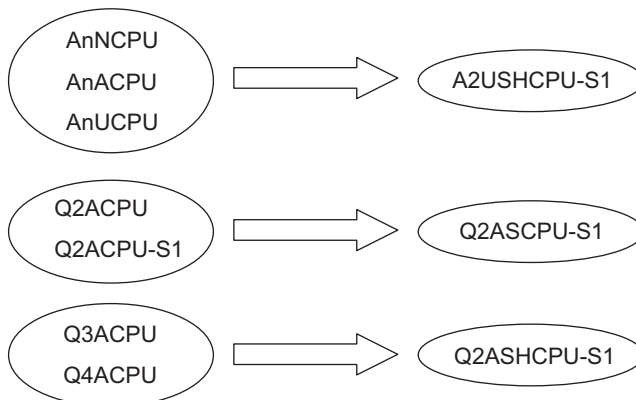
When replacement is difficult
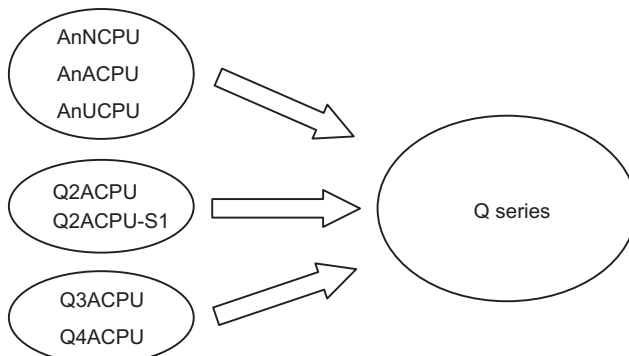
The AnNCPU indicates A1N, A2N,A2N-S1, A3N, A1NP21/R21, A2NP21/R21, A2NP21/R21-S1, A3NP21/R21, A1NP21-S3, A2NP21-S3, A2NP21-S4 and A3NP21-S3.
The AnACPU indicates A2A, A2A-S1, A3A,A2AP21/R21, A2AP21/R21-S1, A3AP21/R21, A2AP21-S3, A2AP21-S4 and A3AP21-S3.
The AnUCPU indicates A2U, A2U-S1, A3U and A4U.

At the first, figure out if each model can be used or not in reference to the basic specifications shown below. As a result of this, if a replacement is available, check the detailed specifications.

○ : Usable, △ : Alternatives are available, × : Unusable

Selection item		A2USHCPU-S1	Q2ASCPU-S1	Q2ASHCPU-S1	QnHCPU
Number of extension stages	1 stage	○	○	○	○
	7 stages	×	×	×	○[*1]
Number of modules mounted	16 within	○	○	○	○
	More than 16	×	×	×	○
I/O points	1024 within	○	○	○	○
	More than 1024	×	×	×	○
Program capacity	30k steps within	○	○	○	○
	60k steps within	×	○	○	○[*1]
	More than 60k steps	×	×	×	○[*1]
I/O control method	Refresh mode	○	○	○	○
	Direct mode	△[*2]	△[*2]	△[*2]	△[*2]
Processing speed LD: μS		0.09	0.2	0.075	0.079 to 0.034
Timer/counter update timing	END processing	○	—	—	—
	Execution of OUT Tn instruction	—	○	○	○
File register (including the extension file register)	Up to 120k points	○[*3*4]	○[*5]	○[*5]	○[*6]
	More than 120k points	×	○[*5]	○[*5]	○[*6]
	Up to 1018k points	×	○[*5]	○[*5]	○[*6]
MELSECNET	NET (II) compatibility	○	○	○	×
	3-tier master station support	○	○	○	×
Number of MELSECNET modules mounted	1 module	○	○	○	×
	2 modules (3-tier master station)	○	○	○	×
	NET/10 compatibility	○	○	○	○[*7]
Number of computer link modules mounted [*8]	6 within	○	○	○	○
	More than 6	×	○	○	○
Bus connection to GOT		○[*9]	○[*10]	○[*10]	○
Microcomputer program (except for SFC)		×	×	×	×
Dedicated instruction	CC-Link	○	△[*11]	△[*11]	△[*11]
	PID/Real constant/ Character string/ Others	○	○	○	○

*1 : Differs according to the CPU type.

*2 : Applicable using partial refresh instructions and direct access instructions.

*3 : Decreases according to the parameter settings.

*4 : Stored in the built-in memory (not extensible).

*5 : A memory card is required.

*6 : The standard RAM + memory card must be used.

*7: The MELSECNET/H mode is not available when any CPU other than Qn(H)CPU are used together.

*8: Up to 6 A series A1SJ71UC24S (-R2, -R4) can be mounted.

*9: Included in the number of computer link modules.

*10: Equivalent to the A series module.

*11: No program is required since the network parameters are used.

1.1.2 Advantages of transition from large-sized A/QnA Series to small-sized AnS/Q2AS Series

(1) RAM memory featured as standard

The RAM memory with 112K to 256K byte memory capacity is built in as a standard feature.
The A2USHCPU-S1 can store file registers and comments since the RAM more than program capacity is featured as standard.
For the Q2ASCPU-S1 and Q2ASHCPU-S1, the RAM featured as standard has a capacity equivalent to the program amount.

(2) E^{2}PROM operation

Installing a memory cassette (when using the A2USHCPU-S1) or a memory card (when using the Q2ASCPU-S1 or Q2ASHCPU-S1) enables the E^{2}PROM operation. (Equivalent to the conventional ROM operation)
Previously, the ROM operation required a dedicated device such as ROM writer. However, programs can be written by the PLC write operation in the same way as for the RAM, and the program is not lost even without a battery.

(3) Compact size

The external dimensions are 130 (H) $\times$ 430(W) $\times$ 110(D)mm (when using a base with 8 slots). The mounting area becomes smaller than that of the large-sized A/QnA series.

(4) Extension connectors equipped on the right and left sides of the main base unit

An extension connector is equipped on each of the right and left sides to allow connection of the extension base unit in any position.
Bus connection to GOT is available even when an extension base is attached.

(5) DIN rail installation

The A1S base unit has screw holes, and a DIN rail installation mechanism on the rear face.

1.1.3 Precautions for transition from large-sized A/QnA series to small-sized AnS/Q2AS series

(1) Be sure to confirm the functions, specifications and handling instructions before using each small-sized AnS/Q2AS series module by referring to the relevant manual.

(2) Be sure to check the operation of whole system before starting the actual operation.

(3) Screws must be tightened for the module mounting.

2 CPU MODULE REPLACEMENT

2.1 List of CPU Module Alternative Models

Large-sized A/QnA series model to be discontinued		Small-sized AnS/Q2AS series alternative models	
Product	Model	Model	Remarks (restrictions)
CPU module	A1NCPU	A2USHCPU-S1	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.09μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 256 points → 1024 points 5) Program capacity: 6k steps → 30k steps 6) File register points: 0 points → 8k points 7) Extension stage: 1 stage → 1 stage 8) Applicable memory: 4KRAM/4KROM/4KEROM → built-in RAM 9) Microcomputer program: Available → Not available
	A1NCPUP21	A2USHCPU-S1 A1SJ71AP21	
	A1NCPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2NCPU	A2USHCPU-S1	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.09μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 512 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 4k points → 8k points 7) Extension stage: 3 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM 9) Microcomputer program: Available → Not available
	A2NCPUP21	A2USHCPU-S1 A1SJ71AP21	
	A2NCPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2NCPU-S1	A2USHCPU-S1	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.09μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 1024 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 4k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM 9) Microcomputer program: Available → Not available
	A2NCPUP21-S1	A2USHCPU-S1 A1SJ71AP21	
	A2NCPUR21-S1	A2USHCPU-S1 A1SJ71AR21	
	A3NCPU	A2USHCPU-S1	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0μs → 0.09μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 2048 points → 1024 points 5) Program capacity: 30k $\times$ 2 steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM 9) Microcomputer program: Available → Not available
	A3NCPUP21	A2USHCPU-S1 A1SJ71AP21	
	A3NCPUR21	A2USHCPU-S1 A1SJ71AR21	

Large-sized A/QnA series model to be discontinued		Small-sized AnS/Q2AS series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
CPU module	A2ACPU	A2USHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2 μs → 0.09 μs 3) PC MIX value: 0.9 → 2.0 4) I/O points: 512 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 3 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A2ACPUP21	A2USHCPU-S1 A1SJ71AP21	
	A2ACPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2ACPU-S1	A2USHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2 μs → 0.09 μs 3) PC MIX value: 0.9 → 2.0 4) I/O points: 1024 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A2ACPUP21-S1	A2USHCPU-S1 A1SJ71AP21	
	A2ACPUR21-S1	A2USHCPU-S1 A1SJ71AR21	
	A3ACPU	A2USHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.15 μs → 0.09 μs 3) PC MIX value: 1.2 → 2.0 4) I/O points: 2048 points → 1024 points 5) Program capacity: 30k × 2 steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A3ACPUP21	A2USHCPU-S1 A1SJ71AP21	
	A3ACPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2UCPU	A2USHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2 μs → 0.09 μs 3) PC MIX value: 0.9 → 2.0 4) I/O points: 512 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 3 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A2UCPU-S1	A2USHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2 μs → 0.09 μs 3) PC MIX value: 0.9 → 2.0 4) I/O points: 1024 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A3UCPU	A2USHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.15 μs → 0.09 μs 3) PC MIX value: 1.2 → 2.0 4) I/O points: 2048 points → 1024 points 5) Program capacity: 30k × 2 steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A4UCPU	A2USHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.15 μs → 0.09 μs 3) PC MIX value: 1.2 → 2.0 4) I/O points: 4096 points → 1024 points 5) Program capacity: 30k × 4 steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM

Large-sized A/QnA series model to be discontinued		Small-sized AnS/Q2AS series alternative models	
Product	Model	Model	Remarks (restrictions)
CPU module	A1NCPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0 μs → 0.09 μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 256 points → 1024 points 5) Program capacity: 6k steps → 30k steps 6) File register points: 0 points → 8k points 7) Extension stage: 1 stage → 1 stage 8) Applicable memory: 4KRAM/4KROM/4KEROM → built-in RAM 9) Microcomputer program: Available → Not available
	A2NCPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0 μs → 0.09 μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 512 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 4k points → 8k points 7) Extension stage: 3 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM 9) Microcomputer program: Available → Not available
	A2NCPUP21-S4	A2USHCPU-S1 A1SJ71AP21-S3	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0 μs → 0.09 μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 1024 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 4k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM 9) Microcomputer program: Available → Not available
	A3NCPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	1) I/O control: Refresh/Direct switching → Refresh only 2) Processing speed (LD instruction): For refresh 1.0 μs → 0.09 μs 3) PC MIX value: 0.2 → 2.0 4) I/O points: 2048 points → 1024 points 5) Program capacity: 30k $\times$ 2 steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM 9) Microcomputer program: Available → Not available
	A2ACPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2 μs → 0.09 μs 3) PC MIX value: 0.9 → 2.0 4) I/O points: 512 points → 1024 points 5) Program capacity: 14k step → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 3 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A2ACPUP21-S4	A2USHCPU-S1 A1SJ71AP21-S3	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2 μs → 0.09 μs 3) PC MIX value: 0.9 → 2.0 4) I/O points: 1024 points → 1024 points 5) Program capacity: 14k steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM
	A3ACPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.15 μs → 0.09 μs 3) PC MIX value: 1.2 → 2.0 4) I/O points: 2048 points → 1024 points 5) Program capacity: 30k $\times$ 2 steps → 30k steps 6) File register points: 8k points → 8k points 7) Extension stage: 7 stages → 1 stage 8) Applicable memory: Depending on the memory cassette → built-in RAM

Large-sized A/QnA series model to be discontinued		Small-sized AnS/Q2AS series alternative models	
Product	Model	Model	Remarks (restrictions)
CPU module	Q2ACPU	Q2ASCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2μs → 0.2μs 3) PC MIX value: 1.3 → 1.3 4) I/O points: 512 points → 1024 points 5) Program capacity: 28k steps → 60k steps 6) File register points: 1018k points × 2 → 1018k points 7) Extension stage: 3 stages → 1 stage 8) Number of memory cards: 2 cards → 1 card 9) Max. memory card SRAM capacity: 2M bytes × 2 cards → 2M bytes × 1 card
	Q2ACPU-S1	Q2ASCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.2μs → 0.2μs 3) PC MIX value: 1.3 → 1.3 4) I/O points: 1024 points → 1024 points 5) Program capacity: 60k steps → 60k steps 6) File register points: 1018k points × 2 → 1018k points 7) Extension stage: 7 stages → 1 stage 8) Number of memory cards: 2 cards → 1 card 9) Max. memory card SRAM capacity: 2M bytes × 2 cards → 2M bytes × 1 card
	Q3ACPU	Q2ASHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.15μs → 0.075μs 3) PC MIX value: 1.8 → 3.8 4) I/O points: 2048 points → 1024 points 5) Program capacity: 92k steps → 60k steps 6) File register points: 1018k points × 2 → 1018k points 7) Extension stage: 7 stages → 1 stage 8) Number of memory cards: 2 cards → 1 card 9) Max. memory card SRAM capacity: 2M bytes × 2 cards → 2M bytes × 1 card
	Q4ACPU	Q2ASHCPU-S1	1) I/O control: Refresh only 2) Processing speed (LD instruction): 0.075μs → 0.075μs 3) PC MIX value: 3.8 → 3.8 4) I/O points: 4096 points → 1024 points 5) Program capacity: 124k steps → 60k steps 6) File register points: 1018k points × 2 → 1018k points 7) Extension stage: 7 stages → 1 stage 8) Number of memory cards: 2 cards → 1 card 9) Max. memory card SRAM capacity: 2M bytes × 2 cards → 2M bytes × 1 card

2.2 CPU Module Specifications Comparisons

○: Usable, △: Partially different in spec. (eg. setting method), ×: Not usable

Function	Contents	Large-sized A/QnA series				Small-sized AnS/Q2AS series		Precautions for replacement	Reference section
		AnN CPU	AnA CPU	AnU CPU	QnA CPU	A2USH CPU-S1	Q2ASH CPU-S1		
Control method	Repetitive operation of a stored program	○	○	○	○	○	○	—	—
I/O control method	Refresh mode/ Direct mode	○[*1]	○[*2]	○[*2]	○[*2]	○[*2]	○[*2]	Use the direct I/O instructions to input/output in the direct mode, as the A2USHCPU-S1/ Q2AS(H)CPU-S1 supports the refresh mode only.	Section 7.3.2
Programming language	Language dedicated to sequence control (Relay symbol, logic symbol, MELSAP language)	○	○	○	○	○	○	The MELSAP language for the A/AnS series is MELSAP-II and that for the QnA/ Q2AS series is MELSAP3.	—
Processing speed	Sequence instructions (μs/step)	1.0	0.15	0.15	0.075	0.09	0.075	—	—
Watchdog timer (WDT)	Watchdog timer (WDT) (ms)	10 to 2000	200	200	10 to 2000	200	10 to 2000	—	—
Memory capacity	User memory capacity (bytes)	Max. 448k (Memory cassette)	Max. 768k (Memory cassette)	Max. 1024k (Memory cassette)	Max. 2036k × 2 (SRAM card)	256k (built-in RAM)	Max. 2036k (SRAM card)	A memory cassette is required for the A series as user memory, while the user memory is included in the AnS series as standard equipment.	Section 2.4.1
Program capacity	Sequence program (steps)	Max. 30k × 2	Max. 30k × 2	Max. 30k × 4	Max. 124k	Max. 30k	Max. 60k	If the program capacity is insufficient, consider replacing by the Q series.	—
	Microcomputer program (bytes)	Max. 58k	×	×	×	×	×	The AnA, AnU, QnA, Q2AS series and A2USHCPU-S1 do not include microcomputer program. Therefore, consider use of sequence program, etc., as the substitution.	—
Number of I/O points	Number of I/O points (points) [*3]	256 to 2048	512 to 2048	512 to 4096	512 to 4096	1024	1024	If the I/O points are insufficient, consider replacing by the Q series.	—
Number of device points	Input device (X) (points) [*4]	256 to 2048	512 to 2048	8192	8192	8192	8192	—	—
	Output device (Y) (points) [*4]	256 to 2048	512 to 2048	8192	8192	8192	8192	—	—
	Internal relay (M) (points)	Total 2048	Total 8192	Total 8192	8192	Total 8192	8192	—	—
	Latch relay (L) (points)				8192		8192	—	—
	Step relay (S) (points)				8192[*5]		8192[*5]	—	—
	Annunciator (F) (points)	256	2048	2048	2048	2048	2048	—	—
	Edge relay (V) (points)	×	×	×	2048	×	2048	—	—
	Link relay (B) (points)	1024	4096	8192	8192	8192	8192	—	—
	Timer (T) (points)	256	2048	2048	2048	2048	2048	—	—
	Counter (C) (points)	256	1024	1024	1024	1024	1024	—	—
	Data register (D) (points)	1024	6144	8192	12288	8192	12288	—	—
	Link register (W) (points)	1024	4096	8192	8192	8192	8192	—	—

○: Usable, △: Partially different in spec. (eg. setting method), ×: Not usable

Function	Contents		Large-sized A/QnA series				Small-sized AnS/Q2AS series		Precautions for replacement	Reference section
			AnN CPU	AnA CPU	AnU CPU	QnA CPU	A2USH CPU-S1	Q2ASH CPU-S1		
Number of device points	File register (R) (points)		8192	8192	8192	32768	8192	32768	—	—
	Accumulator (A) (points)		2	2	2	×	2	×	Accumulators are converted to the special registers (SD718, SD719) upon A → QnA program conversion as they are not included in the QnA and Q2AS series.	—
	Index register	(Z) (points)	1	7	7	16	7	16	—	—
		(V) (points)	1	7	7	×	7	×	This is used as edge relay for the QnA and Q2AS series.	—
	Nesting (N) (points)		8	8	8	15	8	15	—	—
	Pointer (P) (points)		256	256	256	4096	256	4096	—	—
	Special relay (M) (points)		256	256	256	2048	256	2048	—	—
	Special register (D) (points)		256	256	256	2048	256	2048	—	—
Comment points	Comment points (points)[6]		Max. 4032	Max. 4032	Max. 4032	Max. approx. 50k	Max. 4032	Max. approx. 50k	—	—
Self-diagnostics	Watchdog timer (WDT), Memory error detection, CPU error detection, battery error detection		○	○	○	○	○	○	—	—
Operation mode at error occurrence	Stop/continue setting		○	○	○	○	○	○	—	—
Output mode switching at changing from STOP to RUN	Re-output operation status before STOP/ selection of output after operation execution		○	○	○	○	○	○	—	—

*1: Direct I/O is also selectable with the I/O control method setting switch.
*2: Basically, only the refresh mode is applicable, but some instructions/devices can be input/output in the direct mode.
*3: This number means the number of applicable points for the access to actual I/O modules.
*4: This number means the number of usable points on the program.
*5: The step replays (S) of the QnA and Q2AS series are dedicated to the SFC.
*6: Comment points are the points that can be written to CPU.

2.3 CPU Module Functional Comparisons

2.3.1 Functional comparisons between the AnNCPU and the A2USHCPU-S1

○: Usable, △: Partially different in spec. (eg. setting method), × : Not usable

	Function	Contents	Large-sized A series AnNCPU	Small-sized AnS series A2USHCPU-S1	Precautions for replacement	Reference section
Control	Constant scan	Executes the sequence program at constant time intervals regardless of the processing time of the program.	○	○	—	—
Control	Latch (power backup)	Holds the data of devices in the event of power OFF, resetting, and a momentary power failure longer than 20ms.	○	○	—	—
Control	Remote RUN/ STOP	Executes the remote RUN/ STOP using external switches and peripheral devices.	○	○	—	—
Control	PAUSE	Stops operations while holding the output status.	○	○	—	—
Control	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	△	For the A3NCPU, an interrupt program is required for each main program and sub-program separately. For the A2USHCPU-S1, only one main program is available.	—
Control	Microcomputer mode	Executes various controls and operations over utility programs and user created microcomputer programs stored in the microcomputer program area by calling them from the sequence program.	○	×	Consider use of sequence program, etc., as the substitution.	—
Control	Display priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	×	○	Target errors vary by model, but there is no functional difference.	—
Control	ROM operation	Enables operation with parameters and programs stored in ROMs in order not to lose user programs due to battery exhaustion.	○	△	For the A2USHCPU-S1, use the E^{2}PROM memory cassette.	Section 7.3.5
Control	Data protection function (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	○	—	—
Control	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between "re-output operation status before STOP" and "output after operation execution".	○	○	—	—
Control	Clock function	A CPU includes a clock, of which data can be read and written. The clock data consists of year, month, date, hour, minute, second and a day of the week.	○	○	—	—
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN status.	○	○	—	—
Debug	Status latch	Stores the data of all devices in the memory cassette or built-in memory at the occurrence of an error for monitoring by the peripheral device.	○[*1]	○	—	—
Debug	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device.	○[*1]	○	—	—
Debug	Sampling operation (skip operation/ partial operation)	Stops the execution of a sequence program at the specified step.	○	○	—	—
Debug	Off-line switch	Skips the devices used for the OUT instruction in the operation processing of sequence program.	○	×	The A2USHCPU-S1 does not include the off-line switch function.	—
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is in RUN.	○	×	The A2USHCPU-S1 does not include the online I/O module replacement function.	—
Maintenance	Self-diagnostics function	Executes self-diagnostics to check for errors and stop a CPU, etc.	○	○	—	—

*1: Not available for the A1NCPU (P21/R21).

2.3.2 Functional comparisons between the AnACPU, AnUCPU and the A2USHCPU-S1

○: Usable, △: Partially different in spec. (eg. setting method), ×: Not usable

	Function	Contents	Large-sized A series		Small-sized AnS series	Precautions for replacement	Reference section
			AnACPU	AnUCPU	A2USHCPU-S1		
Control	Constant scan	Executes the sequence program at constant time intervals regardless of the processing time of the program.	○	○	○	—	—
	Latch (power backup)	Holds the data of devices in the event of power OFF, resetting, and a momentary power failure longer than 20ms.	○	○	○	—	—
	Remote RUN/ STOP	Executes the remote RUN/ STOP using external switches and peripheral devices.	○	○	○	—	—
	PAUSE	Stops operations while holding the output status.	○	○	○	—	—
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	○	△	For the A3A/A3U/A4UCPU, an interrupt program is required for each main program and sub-program separately. For the A2USHCPU-S1, only one main program is available.	—
	Display priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	○	○	—	—
	ROM operation	Enables operation with parameters and programs stored in ROMs in order not to lose user programs due to battery exhaustion.	○	○	△	For the A2USHCPU-S1, use the E^{2}PROM memory cassette.	Section 7.3.5
	Data protection function (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	○	○	—	—
	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between "re-output operation status before STOP" and "output after operation execution".	○	○	○	—	—
	Clock function	A CPU includes a clock, of which data can be read and written. The clock data consists of year, month, date, hour, minute, second and a day of the week.	○	○	○	—	—
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN status.	○	○	○	—	—
	Status latch	Stores the data of all devices in the memory cassette or built-in memory at the occurrence of an error for monitoring by the peripheral device.	○	○	○	—	—
	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device.	○	○	○	—	—
	Step operation (skip operation/ partial operation)	Stops the execution of a sequence program at the specified step.	○	○	○	—	—
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is in RUN.	○	○	×	The A2USHCPU-S1 does not include the online I/O module replacement function.	—
	Self-diagnostics function	Executes self-diagnostics to check for errors and stop a CPU, etc.	○	○	○	—	—
	Error history	Stores errors detected by the diagnostics function into the CPU. Error details can be monitored from peripheral devices.	○	○	○	—	—

2.3.3 Functional comparisons between the QnACPU and the Q2AS(H)CPU-S1

○: Usable, △: Partially different in spec. (eg. setting method), ×: Not usable

	Function	Contents	Large-sized QnA series	Small-sized Q2AS series	Precautions for replacement	Reference section
			QnACPU	Q2AS(H)CPU-S1		
Control	Constant scan	Executes the sequence program at constant time intervals regardless of the processing time of the program.	○	○	—	—
	Latch (power backup)	Holds the data of devices in the event of power OFF, resetting, and a momentary power failure longer than 20ms.	○	○	—	—
	Remote RUN/ STOP	Executes the remote RUN/ STOP using external switches and peripheral devices.	○	○	—	—
	PAUSE	Stops operations while holding the output status.	○	○	—	—
	Interrupt processing	Executes the program that corresponds to the cause when an interrupt cause occurs.	○	○	—	—
	Display priority of ERROR LED	The settings for ON/OFF of ERROR LED at the occurrence of error.	○	○	—	—
	File management	Manages all of parameters, sequence programs, device comments, file registers, etc as files.	○	△	Some memory configurations differ between the QnACPU and the Q2AS(H)CPU-S1. (For the Q2AS(H)CPU-S1, only one memory card is installed.)	Section 2.4.1 Section 7.3.4
	Structured program	Selects a suitable execution type for program application, and divides each program by designer, process or others.	○	○	—	—
	I/O assignment	Performs the I/O assignment to any individual module regardless of its mounted position.	○	△	Only 1 stage of the extension base unit can be connected though there is no restriction on the I/O assignment.	—
	Boot run (ROM operation)	Executes the sequence program after reading it from the memory card to the CPU built-in memory when the CPU goes to the RUN status.	○	△	Some memory configurations differ between the QnACPU and the Q2AS(H)CPU-S1. (For the Q2AS(H)CPU-S1, only one memory card is installed.)	Section 2.4.1 Section 7.3.5
	Data protection (System protect, Keyword registration/ Password registration)	Prohibits peripheral devices from reading/writing programs and comments in the memory cassettes, the memory card, and built-in memory, etc. of a CPU module.	○	○	—	—
	Initial device value	Sets the initial value of device memory, file registers, and special function modules, etc. when the CPU has become the RUN status.	○	△	Some memory configurations differ between the QnACPU and the Q2AS(H)CPU-S1. (For the Q2AS(H)CPU-S1, only one memory card is installed.)	Section 2.4.1 Section 7.3.5
	The settings of output status at changing from STOP to RUN	The settings for the output status at changing from STOP to RUN (Y) between "re-output operation status before STOP" and "output after operation execution".	○	○	—	—
	Number of general data processing	Sets the number of general data processing executed in one END processing.	○	○	—	—
	Clock function	A CPU incorporates a clock, which can be read/written. The clock data consists of year, month, day, hour, minute, second and a day of the week.	○	○	—	—

○: Usable, △: Partially different in spec. (eg. setting method), ×: Not usable

	Function	Contents	Large-sized QnA series QnACPU	Small-sized Q2AS series Q2AS(H)CPU-S1	Precautions for replacement	Reference section
Debug	Write during RUN	Changes (writes to) the program of a CPU in the RUN status.	○	○	—	—
	Status latch	Stores the data of all devices in the memory card at the occurrence of an error for monitoring by the peripheral device.	○	○	—	—
	Sampling trace	Stores the data of specified devices at the specified intervals for monitoring by the peripheral device.	○*1	○*1	—	—
	Program trace	Collects the execution status of specified programs and steps, and stores them in a file.	○*1*2	○*1*2	—	—
	Simulation function	Detaches I/O modules or special modules from the CPU module and test-operates the program upon the step operation.	○*2	○*2	—	—
	Step operation (skip operation partial operation)	Stops the execution of a sequence program at the specified step.	○	○	—	—
	Execution time measurement (Program list monitor, scan time measurement)	Measures the operation time for each program.	○	○	—	—
	Module access interval reading	Monitors the access interval of special function modules or peripheral devices.	○	○	—	—
Maintenance	Online I/O module replacement	Enables I/O modules to be replaced while the CPU is in RUN.	○	×	The Q2AS(H)CPU-S1 does not include the online I/O module replacement function.	—
	Self-diagnostics function	Executes self-diagnostics to check for errors and stop a CPU, etc.	○	○	—	—
	Error history	Stores errors, which are detected with the diagnostics function, in a CPU or memory card.The stored history can be monitored with peripheral devices.	○	○	—	—

*1: The SRAM card is required.
*2: GPPQ is required. This is not applicable to GX Developer.

2.4 Precautions for CPU Module Replacement

2.4.1 Memory for CPU module

The memory configuration is shown in (1). Examine the following points depending on the memory capacity before replacement and applications.
•Memory to store
•To use or not use a memory card

(1) Memory configuration and data that can be stored

1) Large-sized A series and small-sized AnS series

Large-sized A series   Small-sized AnS series (A2USHCPU-S1)

RAM	Program Parameter Comment File register

EPROM (Optional)	Program Parameter

RAM	Program Parameter Comment File register

For the A2USHCPU-S1, the built-in RAM of 256k bytes is pre-installed.

E^2PROM (Optional)	Program Parameter

For E^2PROM operation in the A2USHCPU-S1, the memory cassette is required.
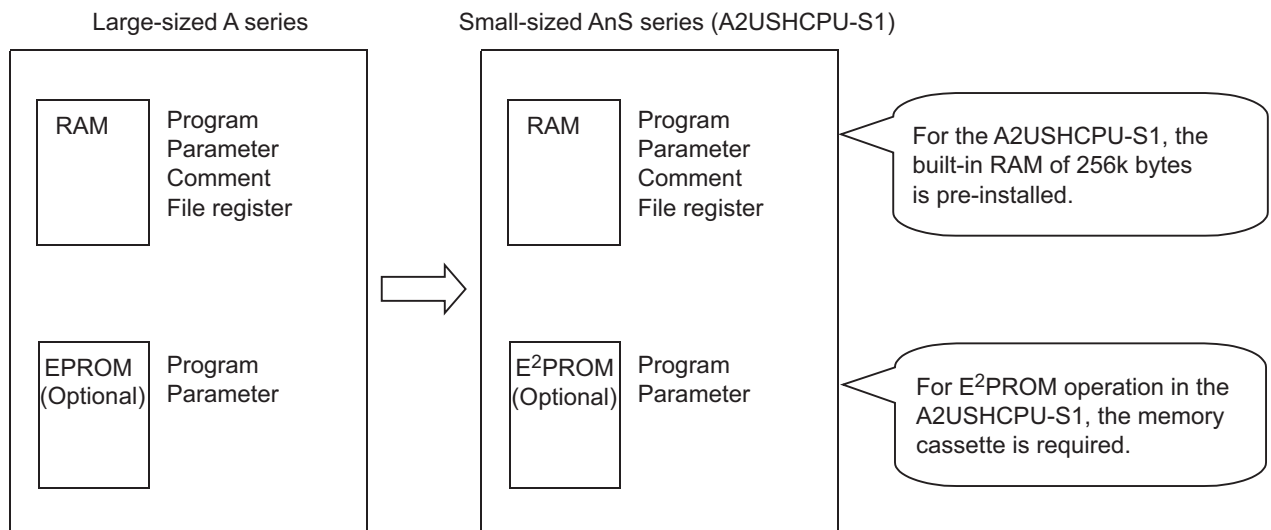
2) Large-sized QnA series and small-sized Q2AS series

Large-sized QnA series | Small-sized Q2AS series (Q2AS(H)CPU-S1)

| RAM | Program
Parameter
Comment
Initial device value |

(Drive 0)

⇒

| RAM | Program
Parameter
Comment
Initial device value |

(Drive 0)

| Memory
card A
(RAM) | Program
Parameter
Comment
Initial device value
File register
Local device
Error history |

(Drive 1)

| Memory
card A
(ROM) | Program
Parameter
Comment
Initial device value
File register |

(Drive 2)

⇒

| Memory
card A
(RAM) | Program
Parameter
Comment
Initial device value
File register
Local device
Error history |

(Drive 1)

| Memory
card A
(ROM) | Program
Parameter
Comment
Initial device value
File register |

(Drive 2)

| Memory
card B
(RAM) | Program
Parameter
Comment
Initial device value
File register
Local device
Error history |

(Drive 3)

| Memory
card B
(ROM) | Program
Parameter
Comment
Initial device value
File register |

(Drive 4)

⇒

No memory card B

For the Q2AS(H)CPU-S1, only one memory card is installed.

(2) Capacity of each memory

The following table shows the memory of CPU modules, in which the user program, etc. is stored, together with its capacity.

Item		Model			
		Large-sized A series	Small-sized AnS series A2USHCPU-S1	Large-sized QnA series	Small-sized Q2AS series Q2AS(H)CPU-S1
Memory cassette	RAM	Max. 1024k bytes	—	—	—
	EPROM	Max. 256k bytes	—	—	—
	E^2PROM	Max. 256k bytes	Max. 64k bytes	—	—
Built-in RAM		—	256k bytes	Max. 496k bytes (Program memory)	Max. 240k bytes (Program memory)
Memory card[1]	SRAM card	—	—	Max. 2M bytes	Max. 2M bytes
	E^2PROM card	—	—	Max. 512k bytes	Max. 512k bytes
	Flash card	—	—	Max. 1M bytes[2]	Max. 1M bytes[2]

[1] For large-sized QnA series, up to two cards can be installed. For small-sized Q2AS series, only one card can be installed.
[2] Maximum value when the Flash memory card (Q1MEM-□SF) is used. (discontinued in August, 2002.)

3 I/O MODULE REPLACEMENT

3.1 List of I/O Module Alternative Models

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)

Input module	AX10	A1SX10	1) External wiring change: Required
			   Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			   Change in number of occupied I/O points: Not required
			4) Specification changes
			   Change in rated input voltage: Not required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required

	AX11	A1SX10	1) External wiring change: Required
			   Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			   Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			   Change in rated input voltage: Not required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required

	AX11EU	A1SX10EU	1) External wiring change: Required
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			   Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			   Change in rated input voltage: Not required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required

	AX20	A1SX20	1) External wiring change: Required
			   Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			   Change in number of occupied I/O points: Not required
			4) Specification changes
			   Change in rated input voltage: Not required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required

A series model to be discontinued		AnS series alternative model	
Product	**Model**	**Model**	**Remarks (restrictions)**
Input module	AX21	A1SX20	1) External wiring change: Required Screw size: M3 → M3.5 2) Change in number of modules: Required (2 modules necessary) 3) Program changes Change in number of occupied I/O points: Not required (32=16×2) 4) Specification changes Change in rated input voltage: Required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required
	AX21EU	A1SX20EU	1) External wiring change: Required 2) Change in number of modules: Required (2 modules necessary) 3) Program changes Change in number of occupied I/O points: Not required (32=16×2) 4) Specification changes Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required
	AX31	A1SX30	1) External wiring change: Required Screw size: M3 → M3.5 2) Change in number of modules: Required (2 modules necessary) 3) Program changes Change in number of occupied I/O points: Not required (32=16×2) 4) Specification changes Change in rated input voltage: Required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required
	AX31-S1	A1SX41	1) External wiring change: Required (Connector terminal block must be converted.) Screw size: M3 → M3.5 2) Change in number of modules: Not required 3) Program changes Change in number of occupied I/O points: Not required 4) Specification changes Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required
	AX40	A1SX40	1) External wiring change: Required Screw size: M3 → M3.5 2) Change in number of modules: Not required 3) Program changes Change in number of occupied I/O points: Not required 4) Specification changes Change in rated input voltage: Not required Change in rated input current: Required Change in ON voltage/ON current: Required Change in OFF voltage/OFF current: Required Change in input resistance: Required 5) Change in functions: Not required

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)
Input module	AX40-UL	A1SX40	1) External wiring change: Required 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated input voltage: Not required 　　Change in rated input current: Required 　　Change in ON voltage/ON current: Required 　　Change in OFF voltage/OFF current: Required 　　Change in input resistance: Required 5) Change in functions: Not required
	AX41	A1SX41	1) External wiring change: Required (Connector terminal block must be converted.) 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated input voltage: Not required 　　Change in rated input current: Required 　　Change in ON voltage/ON current: Required 　　Change in OFF voltage/OFF current: Required 　　Change in input resistance: Required 5) Change in functions: Not required
	AX41-S1	A1SX41-S1	1) External wiring change: Required (Connector terminal block must be converted.) 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated input voltage: Required (12VDC cannot be used.) 　　Change in rated input current: Required 　　Change in ON voltage/ON current: Required 　　Change in OFF voltage/OFF current: Required 　　Change in input resistance: Required 5) Change in functions: Not required
	AX41-UL	A1SX41	1) External wiring change: Required (Connector terminal block must be converted.) 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated input voltage: Not required 　　Change in rated input current: Required 　　Change in ON voltage/ON current: Required 　　Change in OFF voltage/OFF current: Required 　　Change in input resistance: Required 5) Change in functions: Not required
	AX42	A1SX42	1) External wiring change: Not required 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated input voltage: Not required 　　Change in rated input current: Required 　　Change in ON voltage/ON current: Required 　　Change in OFF voltage/OFF current: Required 　　Change in input resistance: Required 5) Change in functions: Not required
	AX42-S1	A1SX42-S1	1) External wiring change: Not required 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated input voltage: Required (12VDC cannot be used.) 　　Change in rated input current: Required 　　Change in ON voltage/ON current: Required 　　Change in OFF voltage/OFF current: Required 　　Change in input resistance: Required 5) Change in functions: Not required

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)

Input module	AX50-S1	None	Alternating with the A1SX40 is recommended.
			1) External wiring change: Required
			    Connect a 3.3kΩ (1W or more) resistor to the external signal wire serially.
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated input voltage: Required
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Not required

	AX60-S1	None	Alternating with the A1SX40 is recommended.
			1) External wiring change: Required
			    Connect a 15kΩ (3W or more) resistor to the external signal wire serially.
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated input voltage: Required
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Not required

	AX70	A1SX71	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Required
			4) Specification changes
			    Change in rated input voltage: Not required
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Not required

	AX71	A1SX71	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated input voltage: Not required
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Not required

	AX80	A1SX80	1) External wiring change: Required
			   Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated input voltage: Not required
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Not required

A series model to be discontinued			AnS series alternative model	
Product	Model	Model	Remarks (restrictions)	

Input module	AX80E	A1SX80-S1	1) External wiring change: Required
			   Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			   Change in number of occupied I/O points: Not required
			4) Specification changes
			   Change in rated input voltage: Required (12VDC cannot be used.)
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required	

	AX81	A1SX81	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			   Change in number of occupied I/O points: Not required
			4) Specification changes
			   Change in rated input voltage: Not required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required	

	AX81B	None	Alternating with the A1SX81 is recommended.
			1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			   Change in number of occupied I/O points: Required
			4) Specification changes
			   Change in rated input voltage: Not required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Functions: The wire breakage detection function is not provided.	

	AX81-S1	A1SX81	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			   Change in number of occupied I/O points: Not required
			4) Specification changes
			   Change in rated input voltage: Not required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required	

	AX81-S2	None	Alternating with the A1SX81 is recommended.
			1) External wiring change: Required (Connector terminal block must be converted.)
			   Connect a 3.3kΩ (1W or more) or 5.6kΩ (2W or more) resistor serially to the external signal wire at 48VDC or 60VDC, respectively.
			2) Change in number of modules: Not required
			3) Program changes
			   Change in number of occupied I/O points: Not required
			4) Specification changes
			   Change in rated input voltage: Required
			   Change in rated input current: Required
			   Change in ON voltage/ON current: Required
			   Change in OFF voltage/OFF current: Required
			   Change in input resistance: Required
			5) Change in functions: Not required	

A series model to be discontinued		AnS series alternative model	
Product	**Model**	**Model**	**Remarks (restrictions)**

Input module	AX81-S3	A1SX80-S1	1) External wiring change: Required
			   Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			     Change in number of occupied I/O points: Required
			4) Specification changes
			     Change in rated input voltage: Required (12VDC cannot be used.)
			     Change in rated input current: Required
			     Change in ON voltage/ON current: Required
			     Change in OFF voltage/OFF current: Required
			     Change in input resistance: Required
			5) Change in functions: Not required

	AX82	A1SX82-S1	1) External wiring change: Required (D sub → FCN connector)
			2) Change in number of modules: Not required
			3) Program changes
			     Change in number of occupied I/O points: Not required
			4) Specification changes
			     Change in rated input voltage: Required (12VDC cannot be used.)
			     Change in rated input current: Required
			     Change in ON voltage/ON current: Required
			     Change in OFF voltage/OFF current: Required
			     Change in input resistance: Required
			5) Change in functions: Not required

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)
Output module	AY10	A1SY10	1) External wiring change: Required 　　Screw size: M3 → M3.5 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated output voltage: Not required 　　Change in rated output current: Not required (Note that a contact life is half.) 5) Change in functions: Not required
	AY10A	A1SY18A	1) External wiring change: Required 　　Screw size: M3 → M3.5 2) Change in number of modules: Required (2 modules necessary) 3) Program changes 　　Change in number of occupied I/O points: Required 4) Specification changes 　　Change in rated output voltage: Not required 　　Change in rated output current: Not required 5) Change in functions: Not required
	AY11	A1SY10	1) External wiring change: Required 　　Screw size: M3 → M3.5 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated output voltage: Not required 　　Change in rated output current: Not required (Note that a contact life is half.) 5) Change in functions: Required (No varistor, relay not replaceable)
	AY11A	A1SY18A	1) External wiring change: Required 　　Screw size: M3 → M3.5 2) Change in number of modules: Required (2 modules necessary) 3) Program changes 　　Change in number of occupied I/O points: Required 4) Specification changes 　　Change in rated output voltage: Not required 　　Change in rated output current: Not required 5) Change in functions: Required (No varistor)
	AY11AEU	A1SY18AEU	1) External wiring change: Required 2) Change in number of modules: Required (2 modules necessary) 3) Program changes 　　Change in number of occupied I/O points: Required 4) Specification changes 　　Change in rated output voltage: Not required 　　Change in rated output current: Not required 5) Change in functions: Required (No varistor)
	AY11E	A1SY10	1) External wiring change: Required 　　Screw size: M3 → M3.5 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated output voltage: Not required 　　Change in rated output current: Not required (Note that a contact life is half.) 5) Change in functions: Required (No fuse, no varistor)
	AY11EEU	A1SY10EU	1) External wiring change: Required 　　Screw size: M3 → M3.5 2) Change in number of modules: Not required 3) Program changes 　　Change in number of occupied I/O points: Not required 4) Specification changes 　　Change in rated output voltage: Not required 　　Change in rated output current: Not required (Note that a contact life is half.) 5) Change in functions: Required (No fuse, no varistor)

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)

Output module	AY11-UL	A1SY10	1) External wiring change: Required
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required (Note that a contact life is half.)
			5) Change in functions: Required (No varistor)

	AY13	A1SY10	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required (Note that a contact life is half.)
			5) Change in functions: Not required

	AY13E	A1SY10	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required (Note that a contact life is half.)
			5) Change in functions: Required (No fuse)

	AY13EU	A1SY10EU	1) External wiring change: Required
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required (Note that a contact life is half.)
			5) Change in functions: Not required

	AY15EU	A1SY14EU	1) External wiring change: Required
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required (Note that a contact life is half.)
			5) Change in functions: Not required

	AY22	A1SY22	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Required (Output 2A → 0.6A)
			5) Change in functions: Required (No fuse, no varistor)

	AY23	A1SY22	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Required (No fast-blow fuse)

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)

Output module	AY40	A1SY40	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY40A	A1SY68A	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			    Response: Slow
			5) Change in functions: Not required

	AY41	A1SY41	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY41-UL	A1SY41	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY42	A1SY42P	1) External wiring change: Not required
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY42-S1	A1SY42P	1) External wiring change: Not required
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			    Response time: Required (0.3ms or less → 1ms or less)
			5) Change in functions: Not required

	AY42-S3	A1SY42P	1) External wiring change: Not required
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Required (The short protection function is equivalent to that of a fuse.)

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)

Output module	AY42-S4	A1SY42P	1) External wiring change: Required (External supply power is required.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY50	A1SY50	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Required (Fuse not replaceable)

	AY51	A1SY50	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY51-S1	A1SY50	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Required (Fuse not replaceable)

	AY51-UL	A1SY50	1) External wiring change: Required
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (32=16×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY60	A1SY60	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Required
			4) Specification changes
			    Change in rated input voltage: Required (48VDC cannot be used)
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY60E	A1SY60E	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Required
			4) Specification changes
			    Change in rated input voltage: Required (48VDC cannot be used)
			    Change in rated output current: Not required
			5) Change in functions: Not required

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)

Output module	AY60S	A1SY60	1) External wiring change: Required
			   Screw size: M3→M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Required
			4) Specification changes
			    Change in rated input voltage: Required (48VDC not applicable)
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY70	A1SY71	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY71	A1SY71	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY72	A1SY71	1) External wiring change: Not required
			2) Change in number of modules: Required (2 modules necessary)
			3) Program changes
			    Change in number of occupied I/O points: Not required (64=32×2)
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

	AY80	A1SY80	1) External wiring change: Required
			   Screw size: M3→M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Required (Fuse not replaceable)

	AY81	A1SY81	1) External wiring change: Required (Connector terminal block must be converted.)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Required (Output 0.5A→0.1A)
			5) Change in functions: Not required

	AY82-EP	A1SY82	1) External wiring change: Required (D sub → FCN connector)
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated output voltage: Not required
			    Change in rated output current: Not required
			5) Change in functions: Not required

A series model to be discontinued		AnS series alternative model	
Product	Model	Model	Remarks (restrictions)

I/O module	AH42	A1SH42	1) External wiring change: Not required
			2) Change in number of modules: Not required
			3) Program changes
			    Change in rated input voltage: Required (32 points occupied)
			4) Specification changes
			    Change in rated input voltage: Required (12VDC cannot be used.)
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Not required

Dynamic scan I/O module	A42XY	A1S42X
		A1S42Y
			1) External wiring change: Required
			2) Change in number of modules: Required (Input and output modules are separately required.)
			3) Program changes
			    Change in rated input voltage: Required (32 points occupied)
			4) Specification changes
			    Change in rated input voltage: Required (12VDC cannot be used.)
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Not required

Interrupt module	AI61	A1SI61	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in number of occupied I/O points: Not required
			4) Specification changes
			    Change in rated input voltage: Not required
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Required (The interrupt processing is set in 4-point units.)

	AI61-S1	A1SI61	1) External wiring change: Required
			    Screw size: M3 → M3.5
			2) Change in number of modules: Not required
			3) Program changes
			    Change in rated input voltage: Required (16 points occupied)
			4) Specification changes
			    Change in rated input voltage: Not required
			    Change in rated input current: Required
			    Change in ON voltage/ON current: Required
			    Change in OFF voltage/OFF current: Required
			    Change in input resistance: Required
			5) Change in functions: Required (The interrupt processing is set in 4-point units.)
			6) Others: The response time is different.

3.2 Specifications Comparisons between I/O Modules

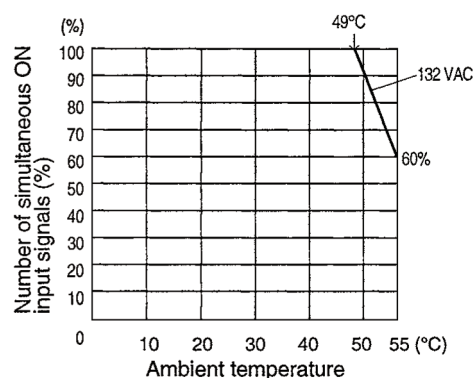### 3.2.1 Specifications comparisons between input modules

(1) Specifications comparisons between the AX10 and the A1SX10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX10	A1SX10	Compati-bility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		100-120VAC 50/60Hz	100-120VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		10mA (100VAC, 60Hz)	Approx. 6mA (100VAC, 60Hz)	△	Rated input current is smaller.[1]
Inrush current		Max. 300mA within 0.3ms (At 132VAC)	Max. 200mA within 1ms (At 132VAC)	○	
Operating voltage range		85 to 132VAC (50/60Hz±5%)	85 to 132VAC (50/60Hz±5%)	○	
Maximum simultaneous input points		100% (16 points) simultaneously ON	Refer to the derating chart. [2]	△	Use within the range shown in the derating chart.
ON voltage/ON current		80VAC or more/6mA or more	80VAC or more/5mA or more	○	
OFF voltage/OFF current		40VAC or less/4mA or less	30VAC or less/1.4mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 10kΩ (60Hz) Approx. 12kΩ (50Hz)	Approx. 18kΩ (60Hz) Approx. 21kΩ (50Hz)	△	Input resistance is greater.[1]
Response time	OFF→ON	15ms or less	20ms or less (100VAC, 60Hz)	△	The response times differ.
	ON→OFF	25ms or less	35ms or less (100VAC, 60Hz)	△	
Common terminal arrangement		16 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3.5, R2-3.5, RAV1.25-3.5, RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.39kg	0.21kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX10.

*2 The figure on the right shows derating.

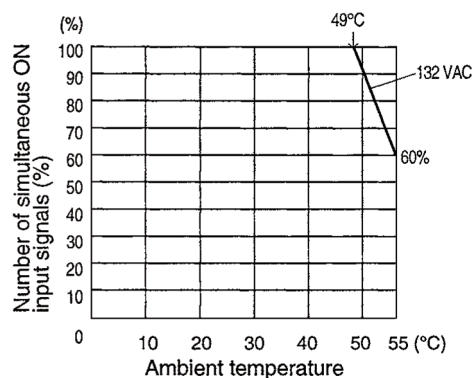## (2) Specifications comparisons between the AX11 and the A1SX10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX11	A1SX10	Compati-bility	Precautions for replacement
Number of input points		32 points	16 points	×	when seventeen or more points are used, use two of the A1SX10 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		100-120VAC 50/60Hz	100-120VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		10mA (100VAC, 60Hz)	Approx. 6mA (100VAC, 60Hz)	△	Rated input current is smaller.[1]
Inrush current		Max. 300mA within 0.3ms (At 132VAC)	Max. 200mA within 1ms (At 132VAC)	○	
Operating voltage range		85 to 132VAC (50/60Hz±5%)	85 to 132VAC (50/60Hz±5%)	○	
Maximum simultaneous input points		60% (20 points) simultaneously ON	Refer to the derating chart. [2]	○	
ON voltage/ON current		80VAC or more/6mA or more	80VAC or more/5mA or more	○	
OFF voltage/OFF current		40VAC or less/4mA or less	30VAC or less/1.4mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 10kΩ (60Hz) Approx. 12kΩ (50Hz)	Approx. 18kΩ (60Hz) Approx. 21kΩ (50Hz)	△	Input resistance is greater.[1]
Response time	OFF→ON	15ms or less	20ms or less (100VAC, 60Hz)	△	The response times differ.
	ON→OFF	25ms or less	35ms or less (100VAC, 60Hz)	△	
Common terminal arrangement		32 points/common (common terminal: TB9,TB18,TB27,TB36)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	Wiring must be changed.
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3.5, R2-3.5, RAV1.25-3.5, RAV2-3.5	×	
Current consumption		0.11A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.49kg	0.21kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX10.

[2] The figure on the right shows derating.

(3) Specifications comparisons between the AX11EU and the A1SX10EU

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX11EU	A1SX10EU	Compati-bility	Precautions for replacement
Number of input points		32 points	16 points	×	when seventeen or more points are used, use two of the A1SX10EU modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		100-120VAC 50/60Hz	100-120VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		Approx. 12mA (120VAC, 60Hz)	Approx. 7mA (120VAC, 60Hz)	△	Rated input current is smaller.[1]
Inrush current		Max. 300mA within 1ms (At 132VAC)	Max. 200mA within 1ms (At 132VAC)	○	
Operating voltage range		85 to 132VAC (50/60Hz±5%)	85 to 132VAC (50/60Hz±5%)	○	
Maximum simultaneous input points		60% (20 points) simultaneously ON	100% simultaneously ON	○	
ON voltage/ON current		79VAC or more/6mA or more	80VAC or more/5mA or more	○	
OFF voltage/OFF current		40VAC or less/4mA or less	30VAC or less/1.4mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 10kΩ (60Hz) Approx. 12kΩ (50Hz)	Approx. 18kΩ (60Hz) Approx. 21kΩ (50Hz)	△	Input resistance is greater.[1]
Response time	OFF→ON	15ms or less (100VAC, 60Hz)	20ms or less (100VAC, 60Hz)	△	The response times differ.
	ON→OFF	25ms or less (100VAC, 60Hz)	35ms or less (100VAC, 60Hz)	△	
Common terminal arrangement		32 points/common (common terminal: TB9,TB18,TB27,TB36)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3.5×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2 (AWG14 to AWG19)	0.75 to 1.25mm^2 (AWG16 to AWG19)	×	
Applicable solderless terminal		RAV1.25-3.5,RAV2-3.5	RAV1.25-3.5	×	
Current consumption		0.15A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
Dielectric withstand voltage (Across external circuit and internal circuit)		1780VAC rms/3cycles (altitude 2000m)	1780VAC rms/3cycles (altitude 2000m)	○	
Insulation resistance		10MΩ or more by insulation resistance tester	10MΩ or more by insulation resistance tester	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.50kg	0.21kg	○	

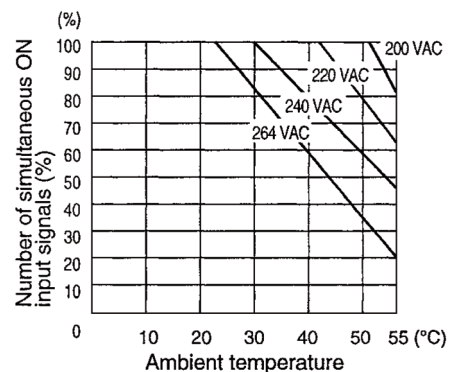[1] Check the specifications of sensor or switch to connect to the A1SX10EU.

(4) Specifications comparisons between the AX20 and the A1SX20

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX20	A1SX20	Compati-bility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		200-240VAC 50/60Hz	200-240VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		10mA (200VAC, 60Hz)	Approx. 9mA (200VAC, 60Hz)	△	Rated input current is smaller.[*1]
Inrush current		Max. 600mA within 0.12ms (At 264VAC)	Max. 500mA within 1ms (At 264VAC)	○	
Operating voltage range		170 to 264VAC (50/60Hz±5%)	170 to 264VAC (50/60Hz±5%)	○	
Maximum simultaneous input points		100% (16 points) simultaneously ON	Refer to the derating chart. [*2]	△	Use within the range shown in the derating chart.
ON voltage/ON current		160VAC or more/5.5mA or more	80VAC or more/4mA or more	○	
OFF voltage/OFF current		70VAC or less/3.5mA or less	30VAC or less/1mA or less	△	OFF current is smaller.[*1]
Input resistance		Approx. 22kΩ (60Hz) Approx. 24kΩ (50Hz)	Approx. 22kΩ (60Hz) Approx. 27kΩ (50Hz)	○	
Response time	OFF→ON	15ms or less	30ms or less (200VAC, 60Hz)	△	The response times differ.
	ON→OFF	25ms or less	55ms or less (200VAC, 60Hz)	△	
Common terminal arrangement		16 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3.5, R2-3.5, RAV1.25-3.5, RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.38kg	0.23kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX20.
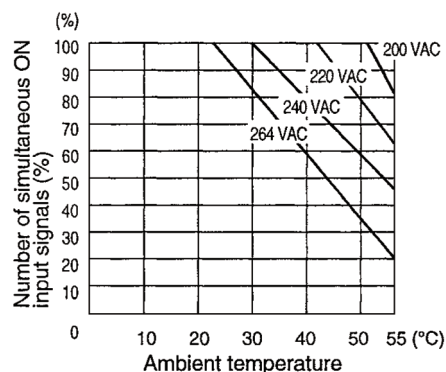
*2 The figure on the right shows derating.

(5) Specifications comparisons between the AX21 and the A1SX20

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX21	A1SX20	Compati-bility	Precautions for replacement
Number of input points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SX20 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		200-240VAC 50/60Hz	200-240VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		10mA (220VAC, 60Hz)	Approx. 9mA (200VAC, 60Hz)	△	Rated input current is smaller.[1]
Inrush current		Max. 600mA within 0.12ms (At 264VAC)	Max. 500mA within 1ms (At 264VAC)	○	
Operating voltage range		170 to 264VAC (50/60Hz±5%)	170 to 264VAC (50/60Hz±5%)	○	
Maximum simultaneous input points		60% (20 points) simultaneously ON	Refer to the derating chart. [2]	△	Use within the range shown in the derating chart.
ON voltage/ON current		160VAC or more/5.5mA or more	80VAC or more/4mA or more	○	
OFF voltage/OFF current		70VAC or less/3.5mA or less	30VAC or less/1mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 22kΩ (60Hz) Approx. 24kΩ (50Hz)	Approx. 22kΩ (60Hz) Approx. 27kΩ (50Hz)	○	
Response time	OFF→ON	15ms or less	30ms or less (200VAC, 60Hz)	△	The response times differ.
	ON→OFF	25ms or less	55ms or less (200VAC, 60Hz)	△	
Common terminal arrangement		32 points/common (common terminal: TB9,TB18,TB27,TB36)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	Wiring must be changed.
Applicable solderless terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3.5, R2-3.5, RAV1.25-3.5, RAV2-3.5	×	
Current consumption		0.11A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.50kg	0.23kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX20.
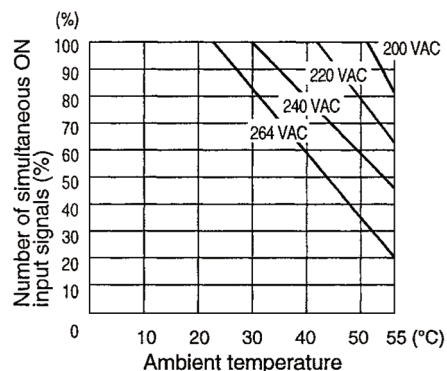
[2] The figure on the right shows derating.

(6) Specifications comparisons between the AX21EU and the A1SX20EU

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX21EU	A1SX20EU	Compati-bility	Precautions for replacement
Number of input points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SX20EU modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		200-240VAC 50/60Hz	200-240VAC 50/60Hz	○	
Input voltage distortion		Within 5%	Within 5%	○	
Rated input current		Approx. 12mA (240VAC, 60Hz)	Approx. 11mA (240VAC, 60Hz)	△	Rated input current is smaller.[1]
Inrush current		Max. 600mA within 0.5ms (At 264VAC)	Max. 500mA within 1ms (At 264VAC)	○	
Operating voltage range		170 to 264VAC (50/60Hz±5%)	170 to 264VAC (50/60Hz±5%)	○	
Maximum simultaneous input points		60% (20 points) simultaneously ON	Refer to the derating chart. [2]	○	
ON voltage/ON current		160VAC or more/5.5mA or more	80VAC or more/4mA or more	○	
OFF voltage/OFF current		70VAC or less/3.5mA or less	30VAC or less/1mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 22kΩ (60Hz) Approx. 24kΩ (50Hz)	Approx. 22kΩ (60Hz) Approx. 27kΩ (50Hz)	○	
Response time	OFF→ON	15ms or less (200VAC, 60Hz)	30ms or less (200VAC, 60Hz)	△	The response times differ.
	ON→OFF	25ms or less (200VAC, 60Hz)	55ms or less (200VAC, 60Hz)	△	
Common terminal arrangement		32 points/common (common terminal: TB9,TB18,TB27,TB36)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3.5×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2 (AWG14 to AWG19)	0.75 to 1.25mm^2 (AWG16 to AWG19)	×	
Applicable solderless terminal		RAV1.25-3.5,RAV2-3.5	RAV1.25-3.5	×	
Current consumption		0.15A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.50kg	0.23kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX20EU.
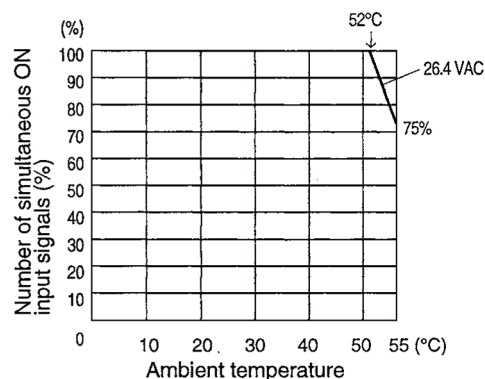
[2] The figure on the right shows derating.

(7) Specifications comparisons between the AX31 and the A1SX30

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX31	A1SX30	Compati-bility	Precautions for replacement
Number of input points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SX30 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC 12/24VAC (50/60Hz)	12/24VDC 12/24VAC (50/60Hz)	○	
Rated input current		8.5mA (24VDC/AC) 4.0mA (12VDC/AC)	8.5mA (24VDC/AC) 4.0mA (12VDC/AC)	○	
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%), 10.2 to 26.4VAC (50/60Hz±5%)	DC10.2 to 26.4V (ripple ratio within 5%), 10.2 to 26.4VAC (50/60Hz±5%)	○	
Maximum simultaneous input points		100% simultaneously ON	Refer to the derating chart. [1]	△	Use within the range shown in the derating chart.
ON voltage/ON current		7VDC/AC or more/2mA or more	7VDC/AC or more/2mA or more	○	
OFF voltage/OFF current		2.5VDC/AC or less/0.7mA or less	2.7VDC/AC or less/0.7mA or less	○	
Input resistance		Approx. 2.7kΩ	Approx. 2.7kΩ	○	
Response time	OFF→ON	20ms or less (12/24VDC), 25ms or less (12/24VAC, 60Hz)	20ms or less (12/24VDC), 25ms or less (12/24VAC, 60Hz)	○	
	ON→OFF	20ms or less (12/24VDC), 20ms or less (12/24VAC, 60Hz)	20ms or less (12/24VDC), 20ms or less (12/24VAC, 60Hz)	○	
Common terminal arrangement		32 points/common (common terminal: TB9,TB18,TB27,TB36)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	Wiring must be changed.
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.11A (TYP. all points ON)	0.05A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.49kg	0.20kg	○	

[1] The figure on the right shows derating.

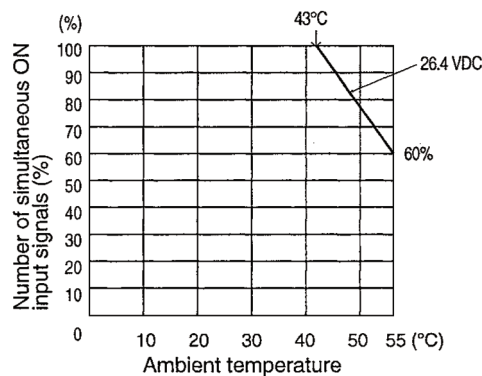### (8) Specifications comparisons between the AX31-S1 and the A1SX41

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX31-S1	A1SX41	Compatibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		24VDC	12/24VDC	○	
Rated input current		8.5mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[1]
Operating voltage range		19.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		100% simultaneously ON	Refer to the derating chart. [2]	△	Use within the range shown in the derating chart.
ON voltage/ON current		16VDC or more/5mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		8VDC or less/2mA or less	4VDC or less/1 mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 2.7kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		32 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: B1, B2)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	40-pin connector (included)	×	Wiring must be changed.[3]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.11A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.49kg	0.21kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX41.

[2] The figure on the right shows derating.

[3] By using connectors/terminal block converter modules (A6TBXY36, etc.), conversion to the terminal block is possible.

(9) Specifications comparisons between the AX40 and the A1SX40

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AX40	A1SX40	Compati-bility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[*1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		100% (8 points/common) simultaneously ON	100% simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		6VDC or less/1.5mA or less	4VDC or less/1mA or less	△	OFF current is smaller.[*1]
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[*1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.36kg	0.20kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX40.

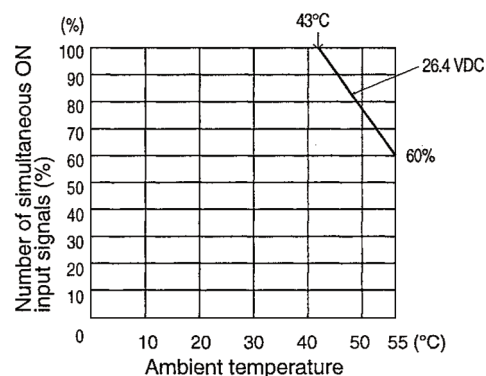## (10) Specifications comparisons between the AX40-UL and the A1SX40

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX40-UL	A1SX40	Compati-bility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		100% (8 points/common) simultaneously ON	100% simultaneously ON	○	
ON voltage/ON current		9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		6VDC or less/1.5mA or less	4VDC or less/1mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3.5×7 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.36kg	0.20kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX40.

(11) Specifications comparisons between the AX41 and the A1SX41

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AX41	A1SX41	Compati-bility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[*1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		60% (5 points/common) simultaneously ON	Refer to the derating chart. [*2]	○	
ON voltage/ON current		9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		6VDC or less/1.5mA or less	4VDC or less/1mA or less	△	OFF current is smaller.[*1]
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[*1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: B1, B2)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	40-pin connector (included)	×	Wiring must be changed.[*3]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.11A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.44kg	0.21kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX41.

*2 The figure on the right shows derating.

*3 By using connectors/terminal block converter modules (A6TBXY36, etc.), conversion to the terminal block is possible.

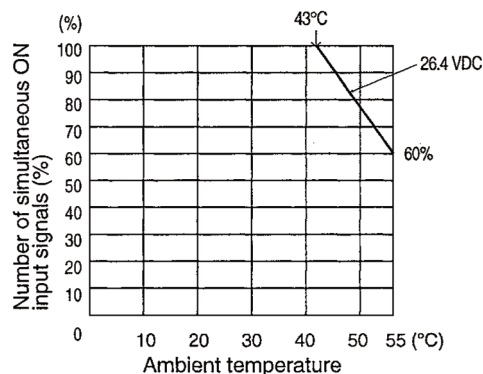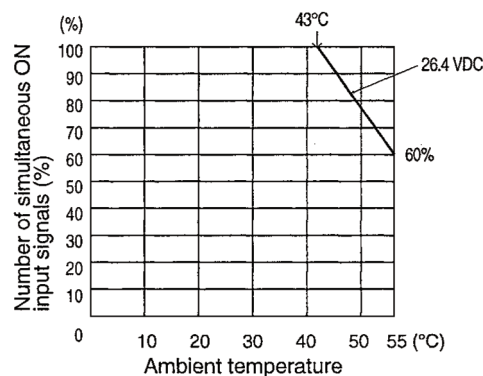### (12) Specifications comparisons between the AX41-S1 and the A1SX41-S1

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX41-S1	A1SX41-S1	Compati-bility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	24VDC	△	12VDC cannot be used.
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 7mA	△	Rated input current is smaller.[*1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	19.2 to 26.4VDC (ripple ratio within 5%)	△	12VDC cannot be used.
Maximum simultaneous input points		60% (5 points/common) simultaneously ON	Refer to the derating chart. [*2]	○	
ON voltage/ON current		9.5VDC or more/3mA or more	17VDC or more/4.5mA or more	△	12VDC cannot be used.
OFF voltage/OFF current		6VDC or less/1.5mA or less	3.5VDC or less/0.8mA or less	△	12VDC cannot be used.
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[*1]
Response time	OFF→ON	0.1ms or less	0.3ms or less (24VDC)	△	The response times differ.
	ON→OFF	0.2ms or less	0.3ms or less (24VDC)	△	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32points/common (common terminal: B1, B2)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	40-pin connector (included)	×	Wiring must be changed.[*3]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.11A (TYP. all points ON)	0.12A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.44kg	0.21kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX41-S1.

*2 The figure on the right shows derating.

*3 By using connectors/terminal block converter modules (A6TBXY36, etc.), conversion to the terminal block is possible.
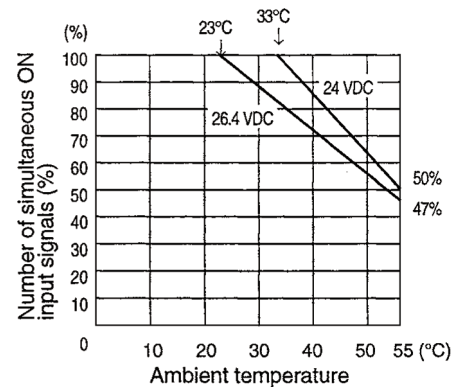
(13) Specifications comparisons between the AX41-UL and the A1SX41

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX41-UL	A1SX41	Compati-bility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		Approx. 4mA/Approx. 10mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		60% (5 points/common) simultaneously ON	Refer to the derating chart. [2]	○	
ON voltage/ON current		9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		6VDC or less/1.5mA or less	4VDC or less/1mA or less	△	OFF current is smaller.[1]
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: B1, B2)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3.5×6 screws)	40-pin connector (included)	×	
Applicable wire size		0.75 to 2mm²	0.3mm²	×	Wiring must be changed.[3]
Applicable solderless terminal		R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	—	×	
Current consumption		0.11A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.44kg	0.21kg	○	

*1   Check the specifications of sensor or switch to connect to the A1SX41.

*2   The figure on the right shows derating.

*3   By using connectors/terminal block converter modules (A6TBXY36, etc.), conversion to the terminal block is possible.
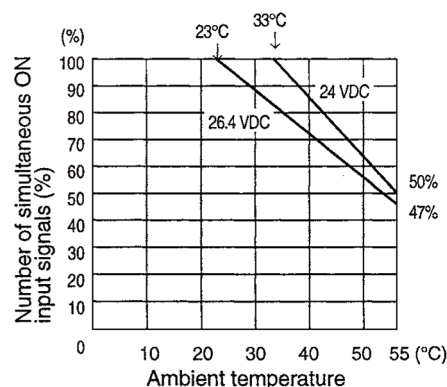
(14) Specifications comparisons between the AX42 and the A1SX42

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX42	A1SX42	Compati-bility	Precautions for replacement
Number of input points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 2mA/Approx. 5mA	△	Rated input current is smaller. [*1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		60% (20 points/common) simultaneously ON	Refer to the derating chart. [*2]	△	Use within the range shown in the derating chart.
ON voltage/ON current		9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		6VDC or less/1.5mA or less	4VDC or less/0.6mA or less	△	OFF current is smaller. [*1]
Input resistance		Approx. 3.4kΩ	Approx. 5kΩ	△	Input resistance is greater. [*1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		32 points/common (common terminal: 1B1,1B2,2B1,2B2)	32 points/common (common terminal: 1B1,1B2,2B1,2B2)	○	
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED) 32 point switch-over using a switch	○	
External connection		40-pin connector (with solder) × 2	40-pin connector (with solder) × 2	○	
Applicable wire size		0.3mm²	0.3mm²	○	
Current consumption		0.12A (TYP. all points ON)	0.09A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.51kg	0.28kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX42.

*2 The figure on the right shows derating.

(15) Specifications comparisons between the AX42-S1 and the A1SX42-S1

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX42-S1	A1SX42-S1	Compati-bility	Precautions for replacement
Number of input points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	24VDC	△	12VDC cannot be used.
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 5mA	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	19.2 to 26.4VDC (ripple ratio within 5%)	△	12VDC cannot be used.
Maximum simultaneous input points		60% (20 points/common) simultaneously ON	Refer to the derating chart. [2]	△	Use within the range shown in the derating chart.
ON voltage/ON current		9.5VDC or more/3mA or more	18.5VDC or more/3.5mA or more	△	12VDC cannot be used.
OFF voltage/OFF current		6VDC or less/1.5mA or less	3VDC or less/0.45mA or less	△	12VDC cannot be used.
Input resistance		Approx. 3.4kΩ	Approx. 4.7kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	0.5ms or less	0.3ms or less (24VDC)	○	
	ON→OFF	0.5ms or less	0.3ms or less (24VDC)	○	
Common terminal arrangement		32 points/common (common terminal: 1B1,1B2,2B1,2B2)	32 points/common (common terminal: 1B1,1B2,2B1,2B2)	○	
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED) 32 point switch-over using a switch	○	
External connection		40-pin connector (with solder) ×2	40-pin connector ×2 (included)	○	
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring connectors×2	External wiring connectors×2	○	
Current consumption		0.12A (TYP. all points ON)	0.16A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.51kg	0.28kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX42-S1.

[2] The figure on the right shows derating.

(16) Specifications comparisons between the AX50-S1 and the A1SX40

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX50-S1	A1SX40	Compati-bility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		48VDC	12/24VDC	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Rated input current		4mA	Approx. 3mA/Approx. 7mA	○	
Operating voltage range		38.4 to 57.6VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Maximum simultaneous input points		100% (8 points/common) simultaneously ON	100% simultaneously ON	○	
ON voltage/ON current		34VDC or more/3mA or more	8VDC or more/2mA or more	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
OFF voltage/OFF current		10VDC or less/1mA or less	4VDC or less/1mA or less	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Input resistance		Approx. 11kΩ	Approx. 3.3kΩ	×	Input resistance is smaller.[*1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.37kg	0.20kg	○	

*1   Connect a resistor of 3.3kΩ (1W or more) serially to the external signal line that connects external devices to the A1SX40.

(17) Specifications comparisons between the AX60-S1 and the A1SX40

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX60-S1	A1SX40	Compati-bility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		100/110/125VDC	12/24VDC	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Rated input current		2mA	Approx. 3mA/Approx. 7mA	○	
Maximum inrush current		65mA (121VDC) 75mA (140VDC)	—	○	
Operating voltage range		85 to 140VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Maximum simultaneous input points		60% (5 points/common) simultaneously ON	100% simultaneously ON	○	
ON voltage/ON current		80VDC or more/1.4mA or more	8VDC or more/2mA or more	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
OFF voltage/OFF current		20VDC or less/0.5mA or less	4VDC or less/1mA or less	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Input resistance		Approx. 50kΩ	Approx. 3.3kΩ	×	Input resistance is smaller.[*1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	20ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common	16 points/common (common terminal: TB9,TB18)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.40kg	0.20kg	○	

*1   Connect a resistor of 15kΩ (3W or more) serially to the external signal line that connects external devices to the A1SX40.
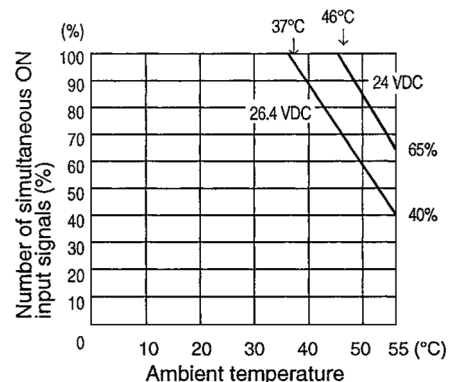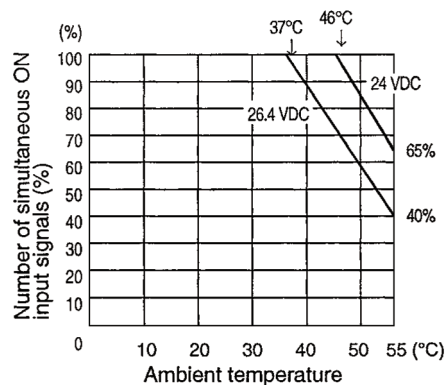
(18) Specifications comparisons between the AX70 and the A1SX71

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX70	A1SX71	Compati-bility	Precautions for replacement
Number of input points		16 points	32 points	×	Set sixteen points in the I/O assignment of Parameter.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		5V/12V/24VDC	5V/12V/24VDC	○	
Rated input current		3.5mA/2mA/4.5mA(TYP.), 5.5mA/3mA/6mA(MAX.)	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA 24VDC Approx. 7mA	△	Rated input current is smaller.[2]
Operating voltage range		4.5 to 5.5VDC (SW ON), 10.2 to 26.4VDC (SW OFF)	4.5 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		100% (8points/common) simultaneously ON	Refer to the derating chart. [1]	△	Use within the range shown in the derating chart.
ON voltage/ON current		3.5VDC or more/1.0mA or more (SW ON), 5VDC or more/1.0mA or more (SW OFF)	3.5VDC or more/1mA or more	○	
OFF voltage/OFF current		1.1VDC or less/0.2mA or less (SW ON), 2VDC or less/0.2mA or less (SW OFF)	1VDC or less/0.1mA or less	△	OFF current is smaller.[2]
Input resistance		Approx. 1.4kΩ (SW ON), Approx. 5.5kΩ (SW OFF)	Approx. 3.5kΩ	△	Input resistance is greater.[2]
Response time	OFF→ON	1.5ms or less	1.5ms or less	○	
	ON→OFF	3ms or less	3ms or less	○	
Common terminal arrangement		8 points/common (common terminal: TB9, TB18)	32 points/common (common terminal: B1, B2)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	40-pin connector (included)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.055A (TYP. all points ON)	0.075A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.36kg	0.19kg	○	

*1　The figure on the right shows derating.

*2　Check the specifications of sensor or switch to connect to the A1SX71.

(19) Specifications comparisons between the AX71 and the A1SX71

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX71	A1SX71	Compati-bility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		5V/12V/24VDC	5V/12V/24VDC	○	
Rated input current		3.5mA/2mA/4.5mA(TYP.), 5.5mA/3mA/6mA(MAX.)	5VDC Approx. 1.2mA 12VDC Approx. 3.3mA 24VDC Approx. 7mA	△	Rated input current is smaller.[*1]
Operating voltage range		4.5 to 5.5VDC (SW ON), 10.2 to 26.4VDC (SW OFF)	4.5 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		100% (8points/common) simultaneously ON	Refer to the derating chart. [*2]	△	Use within the range shown in the derating chart.
ON voltage/ON current		3.5VDC or more/1.0mA or more (SW ON), 5VDC or more/1.0mA or more (SW OFF)	3.5VDC or more/1mA or more	○	
OFF voltage/OFF current		1.1VDC or less/0.2mA or less (SW ON), 2VDC or less/0.2mA or less (SW OFF)	1VDC or less/0.1mA or less	△	OFF current is smaller.[*2]
Input resistance		Approx. 1.4kΩ (SW ON), Approx. 5.5kΩ (SW OFF)	Approx. 3.5kΩ	△	Reduced at SW OFF.[*2]
Response time	OFF→ON	1.5ms or less	1.5ms or less	○	
	ON→OFF	3ms or less	3ms or less	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: B1, B2)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	40-pin connector (included)	×	
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	Wiring must be changed.
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.110A (TYP. all points ON)	0.075A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.45kg	0.19kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX71.

*2 The figure on the right shows derating.

(20) Specifications comparisons between the AX80 and the A1SX80

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX80	A1SX80	Compati-bility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		4mA/10mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[*1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		100% (8points/common) simultaneously ON	100% simultaneously ON (At 26.4VDC)	○	
ON voltage/ON current		9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		6VDC or less/1.5mA or less	4VDC or less/1mA or less	△	OFF current is smaller.[*1]
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[*1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.36kg	0.20kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX80.

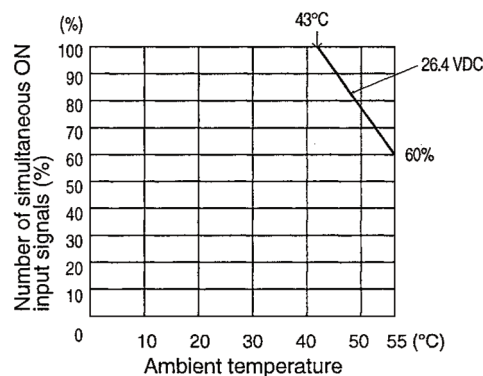## (21) Specifications comparisons between the AX80E and the A1SX80-S1

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX80E	A1SX80-S1	Compatibility	Precautions for replacement
Number of input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	24VDC	△	12VDC cannot be used.
Rated input current		4mA/10mA	Approx. 7mA	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	19.2 to 26.4VDC (ripple ratio within 5%)	△	12VDC cannot be used.
Maximum simultaneous input points		100% (8points/common) simultaneously ON	85% simultaneously ON (At 26.4VDC)	△	Use within the specification range.
ON voltage/ON current		9.5VDC or more/2.6mA or more	17VDC or more/5mA or more	△	12VDC cannot be used.
OFF voltage/OFF current		6VDC or less/1.0mA or less	5VDC or less/1.7mA or less	△	12VDC cannot be used.
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	5.5ms (TYP.)	0.4ms (24VDC)	○	
	ON→OFF	6.0ms (TYP.)	0.5ms (24VDC)	○	
Response time high-speed mode (upper 8 points only)	OFF→ON	0.5ms or less	0.4ms (24VDC)	○	
	ON→OFF	1.0ms or less	0.5ms (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.055A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.36kg	0.2kg	○	

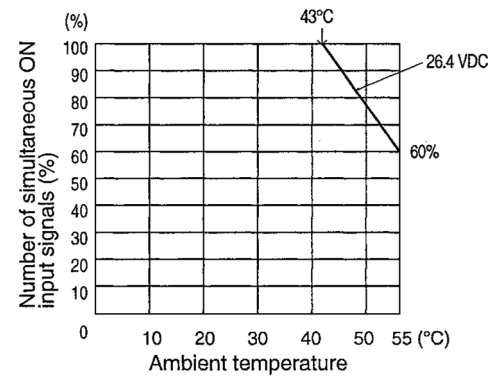*1   Check the specifications of sensor or switch to connect to the A1SX80-S1.

(22) Specifications comparisons between the AX81 and the A1SX81

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX81	A1SX81	Compati-bility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		4mA/10mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[*1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		60% (5points/common) simultaneously ON	Refer to the derating chart. [*2]	○	
ON voltage/ON current		9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
OFF voltage/OFF current		6VDC or less/1.5mA or less	4VDC or less/1mA or less	△	OFF current is smaller.[*1]
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[*1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: 17, 18, 36)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	37-pin D sub-connector (included)	×	Wiring must be changed.[*3]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	―	×	
Current consumption		0.11A (TYP. all points ON)	0.08A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.45kg	0.24kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX81.

*2 The figure on the right shows derating.

*3 By using connectors/terminal block converter modules (A6TBX36-E, etc.), conversion to the terminal block is possible.

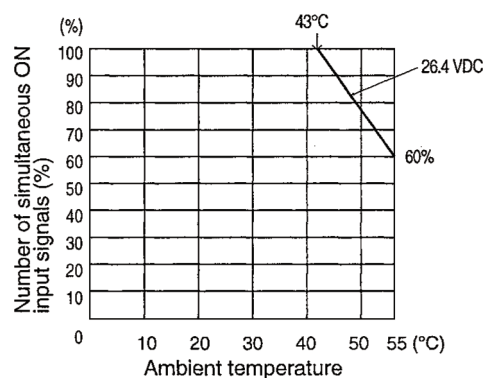## (23) Specifications comparisons between the AX81B and the A1SX81

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX81B	A1SX81	Compati-bility	Precautions for replacement
Number of input points		32 points (64 points occupied)	32 points	×	Set sixty-four points in the I/O assignment of Parameter.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		24VDC	12/24VDC	○	
Rated input current		7mA (When turning ON an external switch) 1.5mA (When turning OFF an external switch)	Approx. 3mA/Approx. 7mA	×	The wire breakage detection function is not provided.
Operating voltage range		21.6 to 30VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	△	Voltages exceeding 26.4VDC cannot be applied.
Maximum simultaneous input points		60% (5points/common) simultaneously ON	Refer to the derating chart. [1]	○	
ON voltage/ON current		21.0VDC or more/5.4mA or more (Normal input) 1.0VDC or less/0.2mA or less (Wire breakage detection)	8VDC or more/2mA or more	×	The wire breakage detection function is not provided.
OFF voltage/OFF current		7.0VDC or less/1.9mA or less (Normal input) 6.0VDC or more/1.3mA or more (Wire breakage detection)	4VDC or less/1mA or less	×	The wire breakage detection function is not provided.
Input resistance		Approx. 3.6kΩ (Normal input) Approx. 4.3kΩ (Wire breakage detection)	Approx. 3.3kΩ	×	The wire breakage detection function is not provided.
Wire breakage detection		Provided	Not provided	×	The wire breakage detection function is not provided.
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
External resistance		0.1kΩ or less (At turning ON) 11.4 to 12.7kΩ or less (At turning OFF) 150kΩ or more (At wire breakage detection)	—	—	Since the wire breakage detection function is not provided, the external resistance is not required.
Parallel resistance with external switch		12kΩ (tolerance: ±5%, 1/4W or more)	—	—	Since the wire breakage detection function is not provided, the external resistance is not required.
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: 17, 18, 36)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED)	○	
External connection		38-point terminal block connector (M3× 6 screws)	37-pin D sub-connector (included)	×	Wiring must be changed.[2]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.125A (TYP. all points ON)	0.080A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.45kg	0.24kg	○	

*1   The figure on the right shows derating.

*2   By using connectors/terminal block converter modules(A6TBX36-E, etc.),
conversion to the terminal block is possible.

(24) Specifications comparisons between the AX81-S1 and the A1SX81

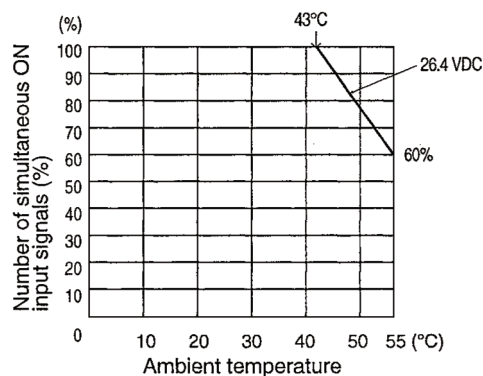○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX81-S1	A1SX81	Compati-bility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		2.5mA/5mA	Approx. 3mA/Approx. 7mA	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
Maximum simultaneous input points		60% (5points/common) simultaneously ON	Refer to the derating chart. [2]	○	
ON voltage/ON current		5.6VDC or more/1.1mA or more	8VDC or more/2mA or more	△	The ON voltage has been increased.[1]
OFF voltage/OFF current		2.4VDC or less/0.39mA or less	4VDC or less/1mA or less	○	
Input resistance		Approx. 4.8kΩ	Approx. 3.3kΩ	△	Input resistance is smaller.[1]
Response time	OFF→ON	10ms or less	10ms or less (24VDC)	○	
	ON→OFF	10ms or less	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: 17, 18, 36)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	37-pin D sub-connector (included)	×	Wiring must be changed.[3]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.105A (TYP. all points ON)	0.080A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.45kg	0.24kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX81.

[2] The figure on the right shows derating.

[3] By using connectors/terminal block converter modules (A6TBX36-E, etc.), conversion to the terminal block is possible.

(25) Specifications comparisons between the AX81-S2 and the A1SX81

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX81-S2	A1SX81	Compatibility	Precautions for replacement
Number of input points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		48/60VDC	12/24VDC	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Rated input current		3mA/4mA	Approx. 3mA/Approx. 7mA	○	
Operating voltage range		41 to 66VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Maximum simultaneous input points		60% (5points/common) simultaneously ON	Refer to the derating chart. [*2]	○	
ON voltage/ON current		31VDC or more/1.7mA or more	8VDC or more/2mA or more	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
OFF voltage/OFF current		10VDC or less/0.5mA or less	4VDC or less/1mA or less	×	Voltages exceeding 26.4VDC cannot be applied.[*1]
Input resistance		Approx. 18kΩ	Approx. 3.3kΩ	×	Input resistance is smaller.
Response time	OFF→ON	20ms or less (60VDC)	10ms or less (24VDC)	○	
	ON→OFF	20ms or less (60VDC)	10ms or less (24VDC)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	32 points/common (common terminal: 17, 18, 36)	△	As 4 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	37-pin D sub-connector (included)	×	Wiring must be changed.[*3]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.110A (TYP. all points ON)	0.080A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.45kg	0.24kg	○	

*1 For use of 48VDC, connect a resistor of 3.3kΩ (1W or more) in series with the external signal line connected between the A1SX81 and an external device.
For use of 60VDC, connect a resistor of 5.6kΩ (2W or more) in series with the external signal line connected between the A1SX81 and an external device.

*2 The figure on the right shows derating.

*3 By using connectors/terminal block converter modules (A6TBX36-E, etc.), conversion to the terminal block is possible.

(26) Specifications comparisons between the AX81-S3 and the A1SX80-S1

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AX81-S3	A1SX80-S1	Compati-bility	Precautions for replacement
Number of input points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SX80-S1 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	24VDC	△	12VDC cannot be used.
Rated input current		4mA/10mA	Approx. 7mA	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	19.2 to 26.4VDC (ripple ratio within 5%)	△	12VDC cannot be used.
Maximum simultaneous input points		60% (5points/common) simultaneously ON	85% simultaneously ON (26.4VDC)	△	Use within the specification range.
ON voltage/ON current		9.5VDC or more/3mA or more	17VDC or more/5mA or more	△	12VDC cannot be used.
OFF voltage/OFF current		6VDC or less/1.5mA or less	5VDC or less/1.7mA or less	△	12VDC cannot be used.
Input resistance		Approx. 2.4kΩ	Approx. 3.3kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	0.1ms or less	0.4ms (24VDC)	△	The response times differ.
	ON→OFF	0.2ms or less	0.5ms (24VDC)	△	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	16 points/common (common terminal: TB9,TB18)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.110A (TYP. all points ON)	0.050A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.45kg	0.2kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SX80-S1.

(27) Specifications comparisons between the AX82 and the A1SX82-S1

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AX82	A1SX82-S1	Compati-bility	Precautions for replacement
Number of input points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	24VDC	△	12VDC cannot be used.
Rated input current		Approx. 3mA/Approx. 7mA	Approx. 5mA	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC (ripple ratio within 5%)	19.2 to 26.4VDC (ripple ratio within 5%)	△	12VDC cannot be used.
Maximum simultaneous input points		40 points (When located next to the power supply module : 26 points)	50% (16points/common) simultaneously ON (24VDC)	△	Use within the specification range.
ON voltage/ON current		9.5VDC or more/2.6mA or more	18.5VDC or more/3.5mA or more	△	12VDC cannot be used.
OFF voltage/OFF current		6VDC or less/1.0mA or less	3VDC or less/0.45mA or less	△	12VDC cannot be used.
Input resistance		Approx. 3.4kΩ	Approx. 4.7kΩ	△	Input impedance is larger.[1]
Response time	OFF→ON	10ms or less	0.3ms (24VDC)	○	
	ON→OFF	10ms or less	0.3ms (24VDC)	○	
Common terminal arrangement		32 points/common (common terminal: 1-17,1-18,1-36,2-17,2-18,2-36)	32 points/common (common terminal: 1B1,1B2,2B1,2B2)	○	
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED) 32 point switch-over using a switch	○	
External connection		37-pin D sub-connector (with solder) × 2	40-pin connector × 2 (included)	×	Connector must be changed.
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring D sub connectors × 2	External wiring connectors × 2	△	The shapes of the accessory connectors are different.
Current consumption		0.12A (TYP. all points ON)	0.16A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.60kg	0.28kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SX82-S1.

3.2.2 Specifications comparisons between output modules

(1) Specifications comparisons between the AY10 and the A1SY10

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AY10	A1SY10	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/Electrical Life is cut to about half.
		200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COS ϕ =0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 100 thousand times or more 200VAC 1A, 240VAC 0.5A (COS ϕ =0.35) 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.44kg	0.25kg	○	

(2) Specifications comparisons between the AY10A and the A1SY18A

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY10A	A1SY18A	Compati-bility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	×	When nine or more points are used, use two of the A1SY18A modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 16A/all points	24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/module	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 200 thousand times or more	○	
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	○	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		Not provided (all points independent)	Not provided (all points independent)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	75mA (24VDC TYP. all points ON)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.240A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.50kg	0.25kg	○	

(3) Specifications comparisons between the AY11 and the A1SY10

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AY11	A1SY10	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	—	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/Electrical Life is cut to about half.
		200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COS ϕ =0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 100 thousand times or more 200VAC 1A, 240VAC 0.5A (COS ϕ =0.35) 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	The varistor is not built in.[1]
Relay socket		Yes	None	×	Replace the module itself when its relay has a failure.
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.50kg	0.25kg	○	

*1   Connect a varistor to reduce external noise.

(4) Specifications comparisons between the AY11A and the A1SY18A

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY11A	A1SY18A	Compati-bility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	×	When nine or more points are used, use two of the A1SY18A modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load) /point 240VAC 2A (COS φ =1)/point 16A/all points	24VDC 2A (resistive load)/point 240VAC 2A (COS φ =1)/point 8A/module	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	—	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 200 thousand times or more	○	
		200VAC 1.5A, 240VAC 1A (COS φ =0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COS φ =0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COS φ =0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COS φ =0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	○	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	The varistor is not built in.[1]
Common terminal arrangement		Not provided (all points independent)	Not provided (all points independent)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC ± 10% Ripple voltage 4Vp-p or less	24VDC ± 10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	75mA (24VDC TYP. all points ON)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25 mm^2	×	Wiring must be changed.
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.240A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.47kg	0.25kg	△	When calculating the weight, note that the weight becomes heavier if the two or more A1SY18A modules are used.

*1   Connect a varistor to reduce external noise.

(5) Specifications comparisons between the AY11AEU and the A1SY18AEU

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY11AEU	A1SY18AEU	Compatibility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	×	When nine or more points are used, use two of the A1SY18AEU modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 24VAC 2A (COSϕ=1)/point 16A/all points	24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		49.9VAC 74.9VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (49.9VAC, 60Hz)	—	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 200 thousand times or more	○	
		24VAC 1.5A (COSϕ=0.7) 200 thousand times or more 24VAC 0.75A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 48VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	○	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	The varistor is not built in.[*1]
Common terminal arrangement		Not provided (all points independent)	Not provided (all points independent)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	75mA (24VDC TYP. all points ON)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	RAV1.25-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.240A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.47kg	0.25kg	△	When calculating the weight, note that the weight becomes heavier if the two or more A1SY18AEU modules are used.

*1   Connect a varistor to reduce external noise.

(6) Specifications comparisons between the AY11E and the A1SY10

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY11E	A1SY10	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		250VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	—	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/ Electrical Life is cut to about half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	The varistor is not built in.[*1]
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		8A MF51NM8 or FGMA250V8A	None	×	The fuse is not built in.[*2]
Fuse blow indicator		None	None	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.47kg	0.25kg	○	

*1   Connect a varistor to reduce external noise.

*2   Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit.

(7) Specifications comparisons between the AY11EEU and the A1SY10EU

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY11EEU	A1SY10EU	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 24VAC 2A (COS ϕ =1)/point 8A/common	24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		49.9VAC 74.9VDC	132VAC 125VDC	○	
Leakage current at OFF		0.1mA (49.9VAC, 60Hz)	—	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/Electrical Life is cut to about half.
		24VAC 1.5A (COS ϕ =0.7) 200 thousand times or more 24VAC 0.75A (COS ϕ =0.35) 200 thousand times or more 24VDC 1A, 48VDC 0.1A (L/R=7ms) 200 thousand times or more	100VAC 2A, 120VAC 2A (COS ϕ =0.7) 200 thousand times or more 100VAC 2A, 120VAC 2A (COS ϕ =0.35) 100 thousand times or more 24VDC 1.5A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	The varistor is not built in.[1]
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		8A MF51NM8 or FGMA250V8A	None	×	The fuse is not built in.[2]
Fuse blow indicator		None	None	○	
External supply power	Voltage	24VDC ± 10% Ripple voltage 4Vp-p or less	24VDC ± 10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	RAV1.25-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.47kg	0.25kg	○	

*1   Connect a varistor to reduce external noise.

*2   Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit.

(8) Specifications comparisons between the AY11-UL and the A1SY10

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY11-UL	A1SY10	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Leakage current at OFF		0.1mA (200VAC, 60Hz)	—	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/Electrical Life is cut to about half.
		200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COS ϕ =0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 100 thousand times or more 200VAC 1A, 240VAC 0.5A (COS ϕ =0.35) 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		Varistor (387 to 473V)	None	×	The varistor is not built in.[1]
Relay socket		Yes	None	×	Replace the module itself when its relay has a failure.
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	150mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		20-point terminal block connector (M3.5×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	○	
Current consumption		0.12A (TYP. all points ON)	0.12A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.50kg	0.25kg	○	

*1 Connect a varistor to reduce external noise.

(9) Specifications comparisons between the AY13 and the A1SY10

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY13	A1SY10	Compati-bility	Precautions for replacement
Number of output points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SY10 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 5A/common	24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/Electrical Life is cut to about half.
		200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COSϕ=0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COSϕ=0.7) 100 thousand times or more 200VAC 1A, 240VAC 0.5A (COSϕ=0.35) 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	290mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.23A (TYP. all points ON)	0.12A (TYP. all points ON)	△	Review current capacity hen using the two A1SY10 modules.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.59kg	0.25kg	○	

(10) Specifications comparisons between the AY13E and the A1SY10

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY13E	A1SY10	Compati-bility	Precautions for replacement
Number of output points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SY10 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/ current		24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 5A/common	24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		250VAC 125VDC	264VAC 125VDC	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/Electrical Life is cut to about half.
		200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 200 thousand times or more 200VAC 0.75A, 240VAC 0.5A (COS ϕ =0.35) 200 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 1.5A, 240VAC 1A (COS ϕ =0.7) 100 thousand times or more 200VAC 1A, 240VAC 0.5A (COS ϕ =0.35) 100 thousand times or more 24VDC 1A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		None	None	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		8A MF51NM8 or FGMA250V8A	None	×	The fuse is not built in.[1]
Fuse blow indicator		None	None	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	290mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.23A (TYP. all points ON)	0.12A (TYP. all points ON)	△	Review current capacity when using the two A1SY10 modules.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.60kg	0.25kg	○	

[1]   Mount a fuse on every external terminal to prevent external devices and modules from burning out upon load short circuit.

(11) Specifications comparisons between the AY13EU and the A1SY10EU

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY13EU	A1SY10EU	Compati-bility	Precautions for replacement
Number of output points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SY10EU modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 24VAC 2A (COS ϕ =1)/point 5A/common	24VDC 2A (resistive load)/point 240VAC 2A (COS ϕ =1)/point 8A/common	○	
Minimum switching load		5VDC 1mA	5VDC 1mA	○	
Maximum switching voltage		49.9VAC 74.9VDC	132VAC 125VDC	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 200 thousand times or more	Rated switching voltage/current load 200 thousand times or more	○	
		24VAC 1.5A (COS ϕ =0.7) 200 thousand times or more 24VAC 0.75A (COS ϕ =0.35) 200 thousand times or more 24VDC 1A, 48VDC 0.1A (L/R=7ms) 200 thousand times or more	100VAC 2A, 120VAC 2A (COS ϕ =0.7) 200 thousand times or more 100VAC 2A, 120VAC 2A (COS ϕ =0.35) 100 thousand times or more 24VDC 1.5A, 100VDC 0.1A (L/R=7ms) 100 thousand times or more	△	Reduce the exchange intervals of the modules as Mechanical/ Electrical Life is cut to about half.
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	290mA (24VDC TYP. all points ON)	90mA (24VDC TYP. all points ON)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	RAV1.25-3.5	×	
Current consumption		0.23A (TYP. all points ON)	0.12A (TYP. all points ON)	△	Review current capacity when using the two A1SY10EU modules.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.59kg	0.25kg	○	

(12) Specifications comparisons between the AY15EU and the A1SY14EU

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY15EU	A1SY14EU	Compati-bility	Precautions for replacement
Number of output points		24 points (32 points occupied)	12 points (16 points occupied)	×	When thirteen or more points are used, use two of the A1SY14EU modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated switching voltage/current		24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	24VDC 2A (resistive load)/point 240VAC 2A (COSϕ=1)/point 8A/common	○	
Minimum switching load		5VDC 10mA	5VDC 10mA	○	
Maximum switching voltage		264VAC 125VDC	264VAC 125VDC	○	
Response time	OFF→ON	10ms or less	10ms or less	○	
	ON→OFF	12ms or less	12ms or less	○	
Mechanical life		20 million times or more	20 million times or more	○	
Electrical life		Rated switching voltage/current load 100 thousand times or more	Rated switching voltage/current load 200 thousand times or more	○	
		200VAC 2A, 240VAC 1.8A (COSϕ=0.7) 200 thousand times or more 200VAC 1.1A, 240VAC 0.9A (COSϕ=0.35) 200 thousand times or more 24VDC 1.1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	200VAC 2A, 240VAC 1.8A (COSϕ=0.7) 200 thousand times or more 200VAC 1.1A, 240VAC 0.9A (COSϕ=0.35) 200 thousand times or more 24VDC 1.1A, 100VDC 0.1A (L/R=7ms) 200 thousand times or more	○	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Surge suppressor		None	None	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB20,TB31)	4 points/common (common terminal: TB5,TB10,TB15)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	24VDC±10% Ripple voltage 4Vp-p or less (Must be SELV power supply)	24VDC±10% Ripple voltage 4Vp-p or less	○	
	Current	220mA (24VDC TYP. all points ON) (Must be SELV power supply)	100mA (24VDC TYP. all points ON) (Must be SELV power supply)	○	
External connection		38-point terminal block connector (M3.5×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2 (AWG14 to AWG19)	0.75 to 1.25mm^2 (AWG16 to AWG19)	×	
Applicable solderless terminal		RAV1.25-3.5,RAV2-3.5	RAV1.25-3.5	×	
Dielectric withstand voltage		(AC external batch relay drive power supply. 5V internal circuit) 2830VAC rms/3cycles (altitude 2000m) (Relay-drive power supply, 5V internal circuit) 500VAC rms/3cycles (altitude 2000m)	(AC external batch relay drive power supply. 5V internal circuit) 2830VAC rms/3cycles (altitude 2000m) (Relay-drive power supply, 5V internal circuit) 500VAC rms/3cycles (altitude 2000m)	○	
Insulation resistance		10MΩ or more by insulation resistance tester	10MΩ or more by insulation resistance tester	○	

○: Compatible, △ : Partial change required, ×: Incompatible

Specification	AY15EU	A1SY14EU	Compati-bility	Precautions for replacement
Current consumption	0.15A (TYP. all points ON)	0.12A (TYP. all points ON)	△	Review current capacity when using two of the A1SY14EU modules.
External dimensions	250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight	0.50kg	0.25kg	○	

(13) Specifications comparisons between the AY22 and the A1SY22

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY22	A1SY22	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		100-240VAC 50/60Hz±5%	100-240VAC 50/60Hz±3Hz	○	
Maximum load voltage		264VAC	264VAC	○	
Maximum load current		2A/point, 3.3A/common	0.6A/point, 2.4A/common	×	Carefully select load for use since the maximum load current per point is lowered.
Minimum load voltage current		24VAC 100mA 100VAC 10mA 240VAC 20mA	24VAC 100mA 100VAC 10mA 240VAC 20mA	○	
Maximum inrush current		40A 10ms or less 15A 100ms or less	20A 10ms or less 8A 100ms or less	△	The inrush current value differs.Use caution on selecting the load to use.
Leakage current at OFF		1.5mA (At 120VAC, 60Hz) 3mA (At 240VAC, 60Hz)	1.5mA or less (At 120VAC, 60Hz) 3mA or less (At 240VAC, 60Hz)	○	
Maximum voltage drop at ON		1.5VAC or less (1 to 2A) 1.8VAC or less (0.2 to 1A) 5VAC or less (0.2A or less)	1.5VAC or less (0.1 to 0.6A) 1.8VAC or less (50 to 100mA) 2VAC or less (10 to 50mA)	○	
Response time	OFF→ON	1ms or less	1ms or less	○	
	ON→OFF	0.5 cycles + 1ms or less	0.5 cycles + 1ms or less	○	
Surge suppressor		CR absorber (0.022μF+47Ω) Varistor (387 to 473V)	CR absorber (0.01μF+47Ω)	△	The varistor is not built in.[*1]
Common terminal arrangement		8 points/common (common terminal: TB9,TB18)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		7A fast blow fuse (1 fuse/common) HP-70k	5A fuse (1 fuse/common) Not replaceable	△	If a fast blow fuse is necessary, connect it outside.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	△	Error LED is also turned ON when the external supply power is OFF.
External supply power	Voltage	—	100-240VAC (85 to 264VAC)	×	External supply power is required.
	Current	—	2mA (TYP. 200VAC/common)	×	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.305A (TYP. all points ON)	0.270A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.71kg	0.24kg	○	

*1 Connect a varistor to reduce external noise.

(14) Specifications comparisons between the AY23 and the A1SY22

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY23	A1SY22	Compati-bility	Precautions for replacement
Number of output points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SY22 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		100-240VAC 40 to 70Hz	100-240VAC 50/60Hz±3Hz	○	
Maximum load voltage		264VAC	264VAC	○	
Maximum load current		0.6A/point, 2.4A/common (When placing next to the power supply module: 1.05A/common)	0.6A/point, 2.4A/common	○	
Minimum load voltage current		24VAC 100mA 100VAC 10mA 240VAC 10mA	24VAC 100mA 100VAC 10mA 240VAC 20mA	△	Carefully select load for use since the minimum load current is increased.
Maximum inrush current		20A 10ms or less 8A 100ms or less	20A 10ms or less 8A 100ms or less	○	
Leakage current at OFF		1.5mA (At 120VAC 60Hz) 3mA (At 240VAC 60Hz)	1.5mA or less (At 120VAC 60Hz) 3mA or less (At 240VAC 60Hz)	○	
Maximum voltage drop at ON		1.5VAC or less (100 to 600mA) 1.8VAC or less (50 to 100mA) 2VAC or less (10 to 50mA)	1.5VAC or less (0.1 to 0.6A) 1.8VAC or less (50 to 100mA) 2VAC or less (10 to 50mA)	○	
Response time	OFF→ON	1ms or less	1ms or less	○	
	ON→OFF	0.5 cycles + 1ms or less	0.5 cycles + 1ms or less	○	
Surge suppressor		CR absorber(0.022μF+47Ω)	CR absorber(0.01μF+47Ω)	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB18,TB27,TB36)	8 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		3.2A fast blow fuse (1 fuse/common) HP-32	5A fuse (1 fuse/common) Not replaceable	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	—	100-240VAC (85 to 264VAC)	×	External supply power is required.
	Current	—	2mA (TYP. 200VAC/common)	×	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.59A (TYP. all points ON)	0.27A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.55kg	0.24kg	○	

(15) Specifications comparisons between the AY40 and the A1SY40

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY40	A1SY40	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 30VDC	△	Voltages exceeding 30VDC can not be applied.
Maximum load current		0.1A/point, 0.8A/common	0.1A/point, 0.8A/common	○	
Maximum inrush current		0.4A	0.4A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	1.0VDC (TYP.) 0.1A 2.5VDC (MAX.) 0.1A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		8 points/common (common terminal: TB10,TB20)	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	12/24VDC (10.2 to 40VDC)	12/24VDC (10.2 to 30VDC)	△	Voltages exceeding 30VDC cannot be applied.
	Current	8mA (TYP. 24VDC/common)	8mA (TYP. 24VDC/common)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.270A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.36kg	0.19kg	○	

(16) Specifications comparisons between the AY40A and the A1SY68A

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AY40A	A1SY68A	Compati-bility	Precautions for replacement
Number of output points		16 points	8 points (16 points occupied)	×	When nine or more points are used, use two of the A1SY68A modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	5/12/24/48VDC	○	
Operating load voltage range		10.2 to 30VDC (Max. applied voltage)	4.5 to 52.8VDC	○	
Maximum load current		0.3A/point	2A/point	○	
Maximum inrush current		1A 100ms or less	8A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (50mA to 0.3A) 1.0VDC (50mA or less)	0.4VDC (MAX.) 2A	○	
Response time	OFF→ON	2ms or less	3ms or less	△	The response times differ.
	ON→OFF	2ms or less (resistive load)	10ms or less (resistive load)	△	
Surge suppressor		Surge suppression diode	Zener diode	○	
Common terminal arrangement		Not provided (all points independent)	Not provided (all points independent)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.19A (TYP. all points ON)	0.11A (TYP. all points ON)	△	Review current capacity when using the two A1SY68 modules.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.42kg	0.20kg	○	

(17) Specifications comparisons between the AY41 and the A1SY41

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY41	A1SY41	Compati-bility	Precautions for replacement
Number of output points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 30VDC	△	Voltages exceeding 30VDC cannot be applied.
Maximum load current		0.1A/point, 1.6A/common	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A	0.4A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	1.0VDC (TYP.) 0.1A 2.5VDC (MAX.) 0.1A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		16 points/common (common terminal: TB18,TB36)	32 points/common (common terminal: A1,A2)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	12/24VDC (10.2 to 40VDC)	12/24VDC (10.2 to 30VDC)	△	Voltages exceeding 30VDC cannot be applied.
	Current	20mA (TYP. 24VDC/common)	8mA (TYP. 24VDC/common)	○	
External connection		38-point terminal block connector (M3×6 screws)	40-pin connector (accessory)	×	Wiring must be changed.[1]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	—	×	
Current consumption		0.23A (TYP. all points ON)	0.50A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.44kg	0.21kg	○	

*1 By using connectors/terminal block converter modules(A6TBXY36, etc.), conversion to the terminal block is possible.

(18) Specifications comparisons between the AY41-UL and the A1SY41

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AY41-UL	A1SY41	Compati-bility	Precautions for replacement
Number of output points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 30VDC	△	Voltages exceeding 30VDC cannot be applied.
Maximum load current		0.1A/point, 1.6A/common	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A	0.4A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	1.0VDC (TYP.) 0.1A 2.5VDC (MAX.) 0.1A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		16 points/common (common terminal: TB18,TB36)	32 points/common (common terminal: A1,A2)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	12/24VDC (10.2 to 40VDC)	12/24VDC (10.2 to 30VDC)	△	Voltages exceeding 30VDC cannot be applied.
	Current	20mA (TYP. 24VDC/common)	8mA (TYP. 24VDC/common)	○	
External connection		38-point terminal block connector (M3.5×6 screws)	40-pin connector (accessory)	×	Wiring must be changed.[1]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Applicable solderless terminal		R1.25-3.5, R2-3, RAV1.25-3.5,RAV2-3.5	—	×	
Current consumption		0.23A (TYP. all points ON)	0.50A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.44kg	0.21kg	○	

*1 By using connectors/terminal block converter modules(A6TBXY36, etc.), conversion to the terminal block is possible.

(19) Specifications comparisons between the AY42 and the A1SY42P

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY42	A1SY42P	Compati-bility	Precautions for replacement
Number of output points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 30VDC	△	Voltages exceeding 30VDC cannot be applied.
Maximum load current		0.1A/point, 2A/common (When placing next to the power supply module: 1.6A/common)	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A	0.7A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (MAX.) 0.1A	○	
Response time	OFF→ON	2ms or less	1ms or less	○	
	ON→OFF	2ms or less (resistive load)	1ms or less (rated load, resistance load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		32 points/common (common terminal: 1A1,1A2,2A1,2A2)	32 points/common (common terminal: 1A1,1A2,2A1,2A2)	○	
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED) 32 point switch-over using a switch	○	
External supply power	Voltage	12/24VDC (10.2 to 40VDC)	12/24VDC (10.2 to 30VDC)	△	Voltages exceeding 30VDC cannot be applied.
	Current	40mA (TYP. 24VDC/common)	14mA (At 24VDC/common)	○	
External connection		40-pin connector (with solder) × 2	40-pin connector (accessory) × 2	○	
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring connectors × 2	External wiring connectors × 2	○	
Current consumption		0.34A (TYP. all points ON)	0.17A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.50kg	0.17kg	○	

(20) Specifications comparisons between the AY42-S1 and the A1SY42P

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AY42-S1	A1SY42P	Compati-bility	Precautions for replacement
Number of output points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 30VDC	△	Voltages exceeding 30VDC cannot be applied.
Maximum load current		0.1A/point, 2A/common (When placing next to the power supply module: 1.6A/common)	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A	0.7A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (MAX.) 0.1A	○	
Response time	OFF→ON	0.1ms or less	1ms or less	△	The response times differ.
	ON→OFF	0.3ms or less (resistive load)	1ms or less (rated load, resistance load)	△	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		32 points/common (common terminal: 1A1,1A2,2A1,2A2)	32 points/common (common terminal: 1A1,1A2,2A1,2A2)	○	
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED) 32 point switch-over using a switch	○	
External supply power	Voltage	12/24VDC (10.2 to 40VDC)	12/24VDC (10.2 to 30VDC)	△	Voltages exceeding 30VDC cannot be applied.
	Current	40mA (TYP. 24VDC/common)	14mA (At 24VDC/common)	○	
External connection		40-pin connector (with solder) × 2	40-pin connector (accessory) × 2	○	
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring connectors × 2	External wiring connectors × 2	○	
Current consumption		0.29A (TYP. all points ON)	0.17A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.50kg	0.17kg	○	

(21) Specifications comparisons between the AY42-S3 and the A1SY42P

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY42-S3	A1SY42P	Compatibility	Precautions for replacement
Number of output points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 40VDC	10.2 to 30VDC	△	Voltages exceeding 30VDC cannot be applied.
Maximum load current		0.1A/point, 2A/common (When placing next to the power supply module: 1.6A/common)	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A/point 3.5A/fuse	0.7A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	0.1VDC (TYP.) 0.1A 0.2VDC (MAX.) 0.1A	○	
Response time	OFF→ON	2ms or less	1ms or less	○	
	ON→OFF	2ms or less (resistive load)	1ms or less (rated load, resistance load)	○	
Surge suppressor		Clamp diode	Zener diode	○	
Common terminal arrangement		32 points/common (common terminal: 1A1,1A2,2A1,2A2)	32 points/common (common terminal: 1A1,1A2,2A1,2A2)	○	
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED) 32 point switch-over using a switch	○	
Fuse		1.6A normal fuse (2 fuses/common)	Not equipped	△	The fuse-equivalent short circuit protection function is incorporated.
Fuse blow indicator		Yes	—	×	Fuse blown is not displayed since the A1SY42P does not have fuses.
External supply power	Voltage	12/24VDC (10.2 to 40VDC)	12/24VDC (10.2 to 30VDC)	△	Voltages exceeding 30VDC cannot be applied.
	Current	40mA (TYP. 24VDC/common)	14mA (At 24VDC/common)	○	
External connection		40-pin connector (with solder) ×2	40-pin connector (included) ×2	○	
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring connectors ×2	External wiring connectors ×2	○	
Current consumption		0.29A (TYP. all points ON)	0.17A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.50kg	0.17kg	○	

(22) Specifications comparisons between the AY42-S4 and the A1SY42P

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AY42-S4	A1SY42P	Compati-bility	Precautions for replacement
Number of output points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 30VDC	○	
Maximum load current		0.1A/point, 1.92A/common	0.1A/point, 2A/common	○	
Maximum inrush current		0.4A 10ms or less	0.7A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		2.5VDC (MAX.) 0.1A 1.0VDC (TYP.) 0.1A	0.1VDC (TYP.) 0.1A 0.2VDC (MAX.) 0.1A	○	
Response time	OFF→ON	2ms or less	1ms or less	○	
	ON→OFF	2ms or less (resistive load)	1ms or less (rated load, resistance load)	○	
Surge suppressor		Photocoupler build-in zener diode	Zener diode	○	
Common terminal arrangement		32 points/common (common terminal: 1A1,1A2,2A1,2A2)	32 points/common (common terminal: 1A1,1A2,2A1,2A2)	○	
Operation indicator		ON indication (LED) 32 point switch-over using a switch	ON indication (LED) 32 point switch-over using a switch	○	
External supply power	Voltage	—	12/24VDC (10.2 to 30VDC)	×	External supply power is required.
	Current	—	14mA (At 24VDC/common)	×	
External connection		40-pin connector (with solder) × 2	40-pin connector × 2 (included)	○	
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring connectors × 2	External wiring connectors × 2	○	
Current consumption		0.50A (TYP. 60% or less simultaneously ON)	0.17A (TYP. all points ON)	○	
External dimensions		250(H)× 37.5(W)× 106(D)mm	130(H)× 34.5(W)× 93.6(D)mm	△	
Weight		0.44kg	0.17kg	○	

(23) Specifications comparisons between the AY50 and the A1SY50

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY50	A1SY50	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 30VDC	○	
Maximum load current		0.5A/point, 2A/common	0.5A/point, 2A/common	○	
Maximum inrush current		7A 10ms or less 3.5A 100ms or less	4A 10ms or less	△	The inrush current value differs.Use caution on selecting the load to use.
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		8 points/common (common terminal: TB10,TB20)	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		2A fast blow fuse(1 fuse/common)	3.2A (not replaceable) (fuse blow capacity: 50A)	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	Yes (When a fuse is blown, LED indicates and signal is output to CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	65mA (TYP. 24VDC/common)	60mA (TYP. 24VDC/common)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.42kg	0.20kg	○	

(24) Specifications comparisons between the AY51 and the A1SY50

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY51	A1SY50	Compati-bility	Precautions for replacement
Number of output points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SY50 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 30VDC	○	
Maximum load current		0.5A/point, 4A/common (When placing next to the power supply module: 3.3A/common)	0.5A/point, 2A/common	○	
Maximum inrush current		4A 10ms or less	4A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		16 points/common (common terminal: TB18,TB36)	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		None	3.2A (not replaceable) (fuse blow capacity: 50A)	○	
Fuse blow indicator		—	Yes (When the fuse is blown, LED indicates and signal is output to CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	50mA (TYP. 24VDC/common)	60mA (TYP. 24VDC/common)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.230A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Review current capacity when using the two A1SY50 modules.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.53kg	0.20kg	○	

(25) Specifications comparisons between the AY51-S1 and the A1SY50

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY51-S1	A1SY50	Compati-bility	Precautions for replacement
Number of output points		32 points	16 points	×	When seventeen or more points are used, use two of the A1SY50 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 30VDC	○	
Maximum load current		0.3A/point, 2A/common (1A/fuse common)	0.5A/point, 2A/common	○	
Maximum inrush current		3A 10ms or less	4A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1VDC (TYP.) 0.3A 1.5VDC (MAX.) 0.3A	0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Transistor built-in zener diode	Zener diode	○	
Common terminal arrangement		16 points/common (common terminal: TB18,TB36) 8 points/fuse common	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		1A fast blow fuse (2 fuses/common in 8 point units) MP-10	3.2A (not replaceable) (fuse blow capacity: 50A)	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	Yes (When a fuse is blown, LED indicates and signal is output to CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	100mA (TYP. 24VDC/common)	60mA (TYP. 24VDC/common)	○	
External connection		38-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.310A (TYP. all points ON)	0.120A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.55kg	0.20kg	○	

(26) Specifications comparisons between the AY51-UL and the A1SY50

○: Compatible, △ : Partial change required, ✕ : Incompatible

Specification		AY51-UL	A1SY50	Compati-bility	Precautions for replacement
Number of output points		32 points	16 points	✕	When seventeen or more points are used, use two of the A1SY50 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 30VDC	○	
Maximum load current		0.5A/point, 4A/common (When placing next to the power supply module: 3.3A/common)	0.5A/point, 2A/common	○	
Maximum inrush current		0.4A 10ms or less	4A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	0.9VDC (TYP.) 0.5A 1.5VDC (MAX.) 0.5A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		16 points/common (common terminal: TB18,TB36)	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		None	3.2A (not replaceable) (fuse blow capacity: 50A)	○	
Fuse blow indicator		None	Yes (When a fuse is blown, LED indicates and signal is output to CPU.)	○	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	50mA (TYP. 24VDC/common)	60mA (TYP. 24VDC/common)	○	
External connection		38-point terminal block connector (M3.5×6 screws)	20-point terminal block connector (M3.5×7 screws)	✕	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	✕	
Applicable solderless terminal		R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	○	
Current consumption		0.230A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Review current capacity hen using the two A1SY50 modules.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.53kg	0.20kg	○	

(27) Specifications comparisons between the AY60 and the A1SY60

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY60	A1SY60	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		24VDC (12/48V)	24VDC	△	Voltages exceeding 26.4VDC cannot be applied.
Operating load voltage range		21.6 to 26.4VDC (10.2 to 56VDC)	21.6 to 26.4VDC	△	Voltages exceeding 26.4VDC cannot be applied.
Maximum load current		2A/point, 5A/common (3A/fuse) (When placing next to the power supply module: 3A/common)	2A/point, 4A/common (25℃), 1.8A/point, 3.6A/common (45℃), 1.6A/point, 3.2A/common (55℃)	△	Since the maximum load current per common is different, pay attention to the current used in the entire module.
Maximum inrush current		4A 100ms or less, 8A 10ms or less	8A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (2A)	0.9VDC (TYP.) 2A, 1.5VDC (MAX.) 2A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Varistor (108 to 132V)	Zener diode	○	
Common terminal arrangement		8 points/common (common terminal: TB10,TB20)	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		3.2A fast blow fuse (2 fuse/common) MP-32	5A fuse (1 fuse/common) Not replaceable	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	Yes (LED is turned ON when a fuse is blown. Signal is output to a PLC CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	24VDC (21.6 to 26.4VDC)	24VDC (21.6 to 26.4VDC)	○	
	Current	65mA (TYP. 24VDC/common)	15mA (TYP. 24VDC/common)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.64kg	0.20kg	○	

(28) Specifications comparisons between the AY60E and the A1SY60E

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY60E	A1SY60E	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		24VDC (12/48V)	5/12/24VDC	△	Voltages exceeding 26.4VDC cannot be applied.
Operating load voltage range		21.6 to 26.4VDC (10.2 to 56VDC)	4.5 to 26.4VDC	△	Voltages exceeding 26.4VDC cannot be applied.
Maximum load current		12/24VDC 2A/point, 48VDC 0.8A/point, 5A/common (When placing next to the power supply module: 3A/common)	2A/point (condition: τ=L/R$\leqq$2.5ms) 4A/common	△	Since the maximum load current per common is different, pay attention to the current used in the entire module.
Maximum inrush current		4A 100ms or less 8A 10ms or less	8A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (2A)	0.2VDC (MAX.) 1A 0.4VDC (MAX.) 2A	○	
Response time	OFF→ON	2ms or less	3ms or less	△	The response times differ.
	ON→OFF	2ms or less (resistive load)	10ms or less (resistive load)	△	
Surge suppressor		Surge suppression diode	Zener diode	○	
Common terminal arrangement		8 points/common (common terminal: TB10,TB20)	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		5A fast blow fuse (2 fuses/common)	7A fuse (1 fuse/common) Not replaceable	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	24VDC (21.6 to 26.4VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	65mA (TYP. 24VDC/common)	10mA (TYP. 24VDC/common)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.200A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.63kg	0.20kg	○	

(29) Specifications comparisons between the AY60S and the A1SY60

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY60S	A1SY60	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		24/48VDC (12V)	24VDC	△	Voltages exceeding 26.4VDC cannot be applied.
Operating load voltage range		21.6 to 52.8VDC (10.2 to 52.8VDC)	21.6 to 26.4VDC	△	Voltages exceeding 26.4VDC cannot be applied.
Maximum load current		2A/point, 6.4A/common (5A/ fuse) (When placing next to the power supply module: 5A/common)	2A/point, 4A/common (25℃), 1.8A/point, 3.6A/common (45℃), 1.6A/point, 3.2A/common (55℃)	△	Since the maximum load current per common is different, pay attention to the current used in the entire module.
Maximum inrush current		4A 100ms or less, 8A 10ms or less	8A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1VDC (2A)	0.9VDC (TYP.) 2A, 1.5VDC (MAX.) 2A	○	
Response time	OFF→ON	1ms or less	2ms or less	△	The response times differ.
	ON→OFF	3ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Varistor (90 to 110V)	Zener diode	○	
Common terminal arrangement		8 points/common (common terminal: TB10,TB20)	8 points/common (common terminal: TB10,TB20)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		5A fast blow fuse (2 fuse/common) MP-50	5A fuse (1 fuse/common) Not replaceable	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	24/48VDC (21.6 to 52.8VDC)	24VDC (21.6 to 26.4VDC)	△	Voltages exceeding 26.4VDC cannot be applied.
	Current	3mA (TYP. 24VDC/common)	15mA (TYP. 24VDC/common)	△	Current capacity must be reviewed.
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.75A (TYP. all points ON)	0.12A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.66kg	0.20kg	○	

(30) Specifications comparisons between the AY70 and the A1SY71

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY70	A1SY71	Compatibility	Precautions for replacement
Number of output points		16 points	32 points	×	Set sixteen points in the I/O assignment of Parameter.
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		5/12VDC	5/12VDC	○	
Operating load voltage range		4.5 to 15VDC	4.5 to 15VDC	○	
Maximum load current		16mA/point, 128mA/common	16mA/point, 256mA/common	○	
Maximum inrush current		50mA 10ms	40mA 10ms or less	△	The inrush current value differs.Use caution on selecting the load to use.
Output voltage at OFF		V_{OH}: 3.5VDC (Vcc=5VDC, I_{OH}=0.4mA)	V_{OH}: 3.5VDC (Vcc=5VDC, I_{OH}=0.4mA)	○	
Maximum voltage drop at ON		V_{OL}: 0.2VDC (I_{OL}=16mA)	V_{OL}: 0.3VDC	△	Check the input specifications of external equipment to be connected since the maximum voltage drop is bigger when turning ON.
Response time	OFF→ON	1ms or less	1ms or less	○	
	ON→OFF	1ms or less	1ms or less (resistive load)	○	
Common terminal arrangement		8 points/common (common terminal: TB10,TB20)	32 points/common (common terminal: A1,A2)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		None	1.6A (not replaceable) (fuse blow capacity: 50A)	○	
Fuse blow indicator		—	Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU)	○	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	5/12VDC (4.5 to 15VDC)	5/12VDC (4.5 to 15VDC)	○	
	Current	55mA (TYP.12VDC/common)	150mA (12VDC/common) (MAX. all points ON)	△	Current capacity must be reviewed.
External connection		20-point terminal block connector (M3×6 screws)	40-pin connector (included)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm²	0.3mm²	×	
Current consumption		0.10A (TYP. all points ON)	0.40A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.36kg	0.19kg	○	

(31) Specifications comparisons between the AY71 and the A1SY71

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY71	A1SY71	Compati-bility	Precautions for replacement
Number of output points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		5/12VDC	5/12VDC	○	
Operating load voltage range		4.5 to 15VDC	4.5 to 15VDC	○	
Maximum load current		16mA/point, 256mA/common (Sink loading)	16mA/point, 256mA/common	○	
Maximum inrush current		50mA 10ms	40mA 10ms or less	△	The inrush current value differs.Use caution on selecting the load to use.
Output voltage at OFF		V_{OH}: 3.5VDC (Vcc=5VDC, I_{OH}=0.4mA)	V_{OH}: 3.5VDC (Vcc=5VDC, I_{OH}=0.4mA)	○	
Maximum voltage drop at ON		V_{OL}: 0.2VDC (I_{OL}=16mA)	V_{OL}: 0.3VDC	△	Check the input specifications of external equipment to be connected since the maximum voltage drop is bigger when turning ON.
Response time	OFF→ON	1ms or less	1ms or less	○	
	ON→OFF	1ms or less	1ms or less (resistive load)	○	
Common terminal arrangement		16 points/common (common terminal: TB18,TB36)	32 points/common (common terminal: A1,A2)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		None	1.6A (not replaceable) (fuse blow capacity: 50A)	○	
Fuse blow indicator		None	Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	△	Since the fuse blown error detection is executed, the parameter or sequence program must be reviewed.
External supply power	Voltage	5/12VDC (4.5 to 15VDC)	5/12VDC (4.5 to 15VDC)	○	
	Current	100mA (TYP.12VDC/common)	150mA (12VDC/common) (MAX. all points ON)	△	Current capacity must be reviewed.
External connection		38-point terminal block connector (M3×6 screws)	40-pin connector (included)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Current consumption		0.20A (TYP. all points ON)	0.40A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.44kg	0.19kg	○	

(32) Specifications comparisons between the AY72 and the A1SY71

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY72	A1SY71	Compati-bility	Precautions for replacement
Number of output points		64 points	32 points	×	When thirty-two or more points are used, use two of the A1SY71 modules.
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		5/12VDC	5/12VDC	○	
Operating load voltage range		4.5 to 15VDC	4.5 to 15VDC	○	
Maximum load current		16mA/point, 512mA/common (Sink loading)	16mA/point, 256mA/common	○	
Maximum inrush current		50mA 10ms	40mA 10ms or less	△	The inrush current value differs.Use caution on selecting the load to use.
Output voltage at OFF		V_{OH}: 3.5VDC (Vcc=5VDC, I_{OH}=0.4mA)	V_{OH}: 3.5VDC (Vcc=5VDC, I_{OH}=0.4mA)	○	
Maximum voltage drop at ON		V_{OL}: 0.2VDC (I_{OL}=16mA)	V_{OL}: 0.3VDC	△	Check the input specifications of external equipment to be connected since the maximum voltage drop is bigger when turning ON.
Response time	OFF→ON	1ms or less	1ms or less	○	
	ON→OFF	1ms or less	1ms or less (resistive load)	○	
Common terminal arrangement		32 points/common (common terminal: 1A1,1A2,2A1,2A2)	32 points/common (common terminal: A1,A2)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		None	1.6A (not replaceable) (fuse blow capacity: 50A)	○	
Fuse blow indicator		None	Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	△	Since the fuse blow error detection is executed, the parameter or sequence program must be reviewed.
External supply power	Voltage	5/12VDC (4.5 to 15VDC)	5/12VDC (4.5 to 15VDC)	○	
	Current	300mA (TYP.12VDC 1-common ON)	150mA (12VDC/common) (MAX. all points ON)	○	
External connection		40-pin connector (with solder) × 2	40-pin connector (included)	○	
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring connectors × 2	External wiring connectors × 1	○	
Current consumption		0.30A (TYP. all points ON)	0.40A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.47kg	0.19kg	○	

(33) Specifications comparisons between the AY80 and the A1SY80

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY80	A1SY80	Compati-bility	Precautions for replacement
Number of output points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 30VDC	○	
Maximum load current		0.5A/point, 2A/common	0.8A/point, 3.2A/common	○	
Maximum inrush current		7A 10ms or less 3.5A 100ms or less	8A 10ms or less	○	
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (MAX.) 0.5A	1.5VDC (MAX.) 0.8A	○	
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		8 points/common (common terminal: TB9,TB19)	8 points/common (common terminal: TB9,TB19)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
Fuse		2A fast blow fuse (1 fuse/common) MP-20	5A fuse (1 fuse/common) Not replaceable (fuse blow capacity: 50A)	△	Connect the fast blow fuse to the external if necessary.
Fuse blow indicator		Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	Yes (LED is turned ON when a fuse is blown. The signal is output to a PLC CPU.)	△	Fuse blow error also occurs when the external supply power is OFF.
External supply power	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	60mA (TYP. 24VDC/common)	20mA (TYP. 24VDC/common)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		R1.25-3,R2-3, RAV1.25-3,RAV2-3	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Current consumption		0.115A (TYP. all points ON)	0.120A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.42kg	0.20kg	○	

(34) Specifications comparisons between the AY81 and the A1SY81

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY81	A1SY81	Compati-bility	Precautions for replacement
Number of output points		32 points	32 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 30VDC	10.2 to 30VDC	○	
Maximum load current		0.5A/point, 4A/common (When placing next to the power supply module: 3A/common)	0.1A/point, 2A/common	△	Carefully select load for use since the maximum load current per point is lowered.[1]
Maximum inrush current		4A 10ms or less	0.4A 10ms or less	△	The inrush current value differs.Use caution on selecting the load to use.
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		1.5VDC (MAX.) 0.5A	1.0VDC (TYP.) 0.1A 2.5VDC (MAX.) 0.1A	△	Because different values for maximum voltage drop are given when turning ON, care should be taken to select loads to be used.
Response time	OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
Surge suppressor		Varistor (52 to 62V)	Zener diode	○	
Common terminal arrangement		16 points/common (common terminal: TB17,TB35)	32 points/common (common terminal: 17,18,36)	△	As 2 commons are reduced to 1,wiring a different voltage for each common is not possible.
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External supply power	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	50mA (TYP. 24VDC/common)	8mA (24VDC/common)	○	
External connection		38-point terminal block connector (M3× 6 screws)	37-pin D sub connector (included)	×	Wiring must be changed. [2]
Applicable wire size		0.75 to 2mm^2	0.3mm^2	×	
Current consumption		0.23A (TYP. all points ON)	0.50A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)× 37.5(W)× 131(D)mm	130(H)× 34.5(W)× 93.6(D)mm	△	
Weight		0.53kg	0.23kg	○	

*1 Replacement with the interface terminal module (FA-TH16YTH11S) allows 1.0A/point, 8A/common outputs.
*2 By using connectors/terminal block converter modules (A6TBY36-E, etc.), conversion to the terminal block is possible.

(35) Specifications comparisons between the AY82-EP and the A1SY82

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		AY82-EP	A1SY82	Compati-bility	Precautions for replacement
Number of output points		64 points	64 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated load voltage		12/24VDC	12/24VDC	○	
Operating load voltage range		10.2 to 26.4VDC	10.2 to 30VDC	○	
Maximum load current		0.1A/point 0.04A/point (60% ON, 55℃)	0.1A/point, 2A/common	○	
Maximum inrush current		No limit (Short protect)	0.4A 10ms or less	△	The inrush current value differs.Use caution on selecting the load to use.
Leakage current at OFF		0.1mA or less	0.1mA or less	○	
Maximum voltage drop at ON		3.5VDC (0.1A) 2.5VDC (0.1A TYP.)	1.0VDC (TYP.) 0.1A 2.5VDC (MAX.) 0.1A	○	
Response time	OFF→ON	0.5ms or less	2ms or less	△	The response times differ.
	ON→OFF	1.5ms or less	2ms or less (resistive load)	△	
Surge suppressor		Surge suppression diode	Zener diode	○	
Common terminal arrangement		32 points/common (common terminal: 1-17,1-18,1-36,2-17,2-18,2-36)	32 points/common (common terminal: 1B1,1B2,2B1,2B2)	○	
Operation indicator		ON indication (LED)	ON indication (LED) 32-point switch-over using a switch	○	
Protection		Yes (Overheat protection function and short-circuit protection function) • Overheat protection function is detected in 1 common units. When Overheat protection function occurs at a 1 point of 1 common, output of all points for the corresponded common terminal is turned OFF.	None	×	No protection function
Protection detection display		None (No signal output to a PLC CPU)	None	×	No protection function
Protection function reset		Automatic reset (reset by canceling overheat protection function)	None	×	No protection function
External power supply	Voltage	12/24VDC (10.2 to 30VDC)	12/24VDC (10.2 to 30VDC)	○	
	Current	50mA (TYP. 24VDC/common)	8mA (24VDC/common)	○	
External connection		37-pin connector (with solder) × 2	40-pin connector	×	Wiring must be changed.
Applicable wire size		0.3mm^2	0.3mm^2	○	
Accessory		External wiring connectors × 2	External wiring connectors × 1	○	
Current consumption		0.29A (TYP. all points ON)	0.93A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions		250(H)×37.5(W)×106(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight		0.58kg	0.27kg	○	

3.3 Specifications Comparisons between I/O Modules

(1) Specifications comparisons between the AH42 and the A1SH42

○: Compatible, △ : Partial change required, × : Incompatible

Specification		AH42	A1SH42	Compati-bility	Precautions for replacement
Input specification	Number of input points	32 points	32 points	○	
	Isolation method	Photocoupler	Photocoupler	○	
	Input type	Sink type	Sink type	○	
	Rated input voltage	12/24VDC	12/24VDC	○	
	Rated input current	Approx. 3mA/Approx. 7mA	Approx. 2mA/Approx. 5mA	△	Rated input current is smaller.[1]
	Operating voltage range	10.2 to 26.4VDC (ripple ratio within 5%)	10.2 to 26.4VDC (ripple ratio within 5%)	○	
	Maximum simultaneous input points	60% simultaneously ON	Refer to the derating chart. [2]	○	
	ON voltage/ON current	9.5VDC or more/3mA or more	8VDC or more/2mA or more	○	
	OFF voltage/OFF current	6VDC or less/1.5mA or less	4VDC or less/0.6mA or less	△	OFF current is smaller.[1]
	Input resistance	Approx. 3.3kΩ	Approx. 5kΩ	△	Input resistance is greater.[1]
	Response time OFF→ON	10ms or less (24VDC)	10ms or less (24VDC)	○	
	ON→OFF	10ms or less (24VDC)	10ms or less (24VDC)	○	
	Common terminal arrangement	32 points/common (common terminal: 1B1,1B2)	32 points/common (common terminal: 1B1,1B2)	○	
Output specification	Number of output points	32 points	32 points	○	
	Isolation method	Photocoupler	Photocoupler	○	
	Output type	Sink type	Sink type	○	
	Rated load voltage	12/24VDC	12/24VDC	○	
	Operating load voltage range	10.2 to 40VDC	10.2 to 30VDC	△	Voltages exceeding 30VDC cannot be applied.
		0.1A/point, 1A/common	0.1A/point, 1.6A/common	○	
	Maximum inrush current	0.4A 10ms or less	0.4A 10ms or less	○	
	Leakage current at OFF	0.1mA or less	0.1mA or less	○	
	Maximum voltage drop at ON	2.5VDC (0.1A) 1.75VDC (5mA) 1.7VDC (1mA)	1.0VDC (TYP.) 0.1A 2.5VDC (MAX.) 0.1A	○	
	Response time OFF→ON	2ms or less	2ms or less	○	
	ON→OFF	2ms or less (resistive load)	2ms or less (resistive load)	○	
	Surge suppressor	Clamp diode	Zener diode	○	
	Common terminal arrangement	32 points/common (common terminal: 2A1,2A2)	32 points/common (common terminal: 2A1,2A2)	○	
	External supply power Voltage	12/24VDC (10.2 to 40VDC)	12/24VDC (10.2 to 30VDC)	△	Voltages exceeding 30VDC cannot be applied.
	Current	40mA (24VDC TYP.)	8mA (At 24VDC)/common (MAX. all points ON)	○	
Operation indicator		ON indication (LED) 32-point switch-over using a switch	ON indication (LED) 32-point switch-over using a switch	○	
External connection		40-pin connector × 2	40-pin connector (included) × 2	○	

Specification	AH42	A1SH42	Compati-bility	Precautions for replacement
Applicable wire size	0.3mm^2	0.3mm^2	○	
Accessory	40-pin connector × 2 (with solder)	40-pin connector × 2 (with solder)	○	
Occupied points	64 points (output 64 points)	32 points (I/O assignment: input/output composite)	×	Output number (Y□)differs.^{*3}
Current consumption	0.25A (TYP. all points ON)	0.50A (TYP. all points ON)	△	Current capacity must be reviewed.
External dimensions	250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	
Weight	0.70kg	0.27kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SH42.

*2 The figure on the right shows derating.

*3 Modify the output number used in the program.
    (For the A1SH42, the same number of X0 to X1F and Y0 to Y1F)
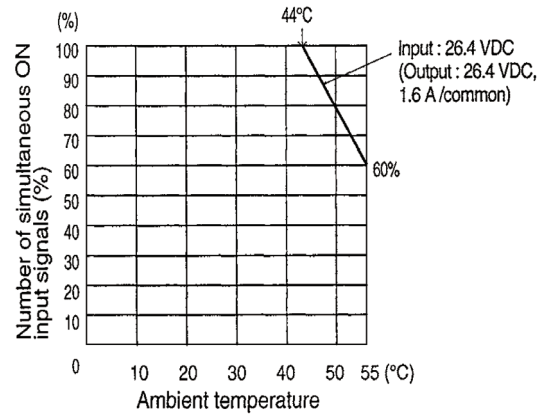
(2) Specifications comparisons between the A42XY and the A1S42X/A1S42Y

(a) Specifications comparisons between the A42XY (input part) and the A1S42X

○: Compatible, △ : Partial change required, ×: Incompatible

Specification		A42XY (input specification)	A1S42X	Compati-bility	Precautions for replacement
Number of input points		64 points	16/32/48/64 points (switch setting)	○	
Isolation method		Photocoupler	Photocoupler	○	
Input type		Dynamic scan of 8 inputs×8	Dynamic scan of 8 inputs×8	○	
Rated input voltage		12/24VDC (10.2 to 26.4VDC ripple ratio within 5%)	12/24VDC (10.2 to 26.4VDC ripple ratio within 5%)	○	
Maximum simultaneous input points		60% simultaneously ON	100% simultaneously ON	○	
ON voltage/ON current		7VDC or more	8VDC or more/2mA or more	△	ON current is greater.[1]
OFF voltage/OFF current		3VDC or less	4VDC or less/1mA or less	○	
Input resistance		Approx. 2.4kΩ	Approx. 2.4kΩ	○	
Response time	OFF→ON	16ms or less	0.4ms or less (24VDC)+13.3ms	○	
	ON→OFF	16ms or less	0.4ms or less (24VDC)+13.3ms	○	
Operation indicator		ON indication (LED) 8-point switch-over using a rotary switch	ON indication (LED) 32-point switch-over using a switch	○	
External supply power	Voltage	12/24VDC (10.2 to 26.4VDC ripple ratio within 5%)	—	×	External supply power is not required.
	Current	55mA TYP.	—	×	
External connection		Input: 16-pin connector	24-pin connector	×	Wiring must be changed.
Applicable wire size		0.3mm^2	0.3mm^2	○	
Occupied points		64 points (output 64 points)	64 points (I/O assignment: input)	△	The number of occupied points is 128 points (64points× 2 = 128 points) when using both modules of the A1S42X and A1S42Y.
Current consumption		0.11A (TYP.)	0.08A (TYP. all points ON)	△	Review current capacity when using with the A1SY42Y.
External dimensions		250(H)× 37.5(W)× 119(D)mm	130(H)× 34.5(W)× 93.6(D)mm	△	
Weight		0.60kg	0.18kg	○	

*1 Check the specifications of sensor or switch to connect to the A1S42X.

(b) Specifications comparisons between the A42XY (output part) and the A1S42Y

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A42XY (output specification)	A1S42Y	Compatibility	Precautions for replacement
Number of output points		64 points	16/32/48/64 points (switch setting)	○	
Isolation method		Photocoupler	Photocoupler	○	
Output type		Dynamic scan of 8 outputs×8	Dynamic scan of 8 outputs×8	○	
Rated load voltage		12/24VDC (10.2 to 26.4VDC ripple ratio within 5%)	12/24VDC (10.2 to 26.4VDC ripple ratio within 5%)	○	
Maximum output current		50mA/point (built in limiting resistor (1kΩ) not used)	0.1A/point	○	
Maximum voltage drop at ON		1.5V on the source side (built in limiting resistor not used) 1V on the sink side	1.1VDC on the source side 1.5VDC on the sink side	△	Voltage dorp is greater.
Maximum simultaneous output points		60% simultaneously ON (built in limiting resistor (1kΩ) not used)	100% simultaneously ON	○	
Dynamic scan synchronization		16ms or less	13.3ms	○	
		16ms or less	13.3ms	○	
Operation indicator		ON indication (LED) 8-point switch-over using a rotary switch	ON indication (LED) 32-point switch-over using a switch	○	
External supply power	Voltage	12/24VDC (10.2 to 26.4VDC ripple ratio within 5%)	12/24VDC (10.2 to 26.4VDC ripple ratio within 5%)	○	
	Current	180mA TYP.	80mA (At 24VDC)/common	○	
External connection		Output: 32-pin connector	24-pin connector	×	Wiring must be changed.
Applicable wire size		0.3mm^2	0.3mm^2	○	
Occupied points		64 points (output 64 points)	64 points (I/O assignment: output)	△	The number of occupied points is 128 points (64points× 2 = 128 points) when using both modules of the A1S42X and A1S42Y.
Current consumption		0.11A (TYP.)	0.10A (TYP. all points ON)	△	Review current capacity when using with the A1S42X.
External dimensions		250(H)×37.5(W)×119(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.60kg	0.19kg	○	

3.4 Specifications Comparisons between Interrupt Modules

(1) Specifications comparisons between the AI61 and the A1SI61

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AI61	A1SI61	Compati-bility	Precautions for replacement
Number of interrupt input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		12/24VDC	12/24VDC	○	
Rated input current		6mA (12VDC) 14mA (24VDC)	4mA (12VDC) 8mA (24VDC)	△	Rated input current is smaller.[1]
Operating voltage range		10.2 to 26.4VDC	10.2 to 26.4VDC	○	
Maximum simultaneous input points		100% (16/common) simultaneously ON	100% (16/common) simultaneously ON	○	
ON voltage		9V or more	9V or more/3mA or more	○	
OFF voltage		4V or less	4V or less/1mA or less	○	
Input resistance		Approx. 2.4kΩ	Approx. 2.7kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	0.2ms or less	0.2ms or less	○	
	ON→OFF	0.2ms or less	0.2ms or less	○	
Interrupt condition setting		1-point unit	4-point unit	△	The point unit for setting whether the interrupt is processed at the rising/falling of input signals has been changed.
Common terminal arrangement		16 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	Wiring must be changed.
Applicable wire size		0.75 to 1.5mm^2	0.75 to 1.25mm^2	×	
Applicable solderless terminal		1.25-3,1.25-YS3A, 2-S3,2-YS3A V1.25-3,V1.25-YS3A, V2-S3,V2-YS3A	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Occupied points		32 points (special 32 points)	32 points (special 32 points)	○	
Current consumption		0.140A (TYP. all points ON)	0.057A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.40kg	0.20kg	○	

[1] Check the specifications of sensor or switch to connect to the A1SI61.

(2) Specifications comparisons between the AI61-SI and the A1SI61

○: Compatible, △: Partial change required, ×: Incompatible

Specification		AI61-S1	A1SI61	Compati-bility	Precautions for replacement
Number of interrupt input points		16 points	16 points	○	
Isolation method		Photocoupler	Photocoupler	○	
Rated input voltage		24VDC	12/24VDC	○	
Rated input current		14mA	4mA (12VDC) 8mA (24VDC)	△	Rated input current is smaller.[1]
Operating voltage range		21.6 to 26.4VDC	10.2 to 26.4VDC	○	
Maximum simultaneous input points		100% (16/common) simultaneously ON	100% (16/common) simultaneously ON	○	
ON voltage		16V or more	9V or more/3mA or more	○	
OFF voltage		9V or less	4V or less/1mA or less	△	The OFF voltage has been reduced.[1]
Input resistance		Approx. 2.4kΩ	Approx. 2.7kΩ	△	Input resistance is greater.[1]
Response time	OFF→ON	2ms or less, 8ms or less	0.2ms or less	○	
	ON→OFF	2ms or less, 8ms or less	0.2ms or less	○	
Interrupt condition setting		1-point unit	4-point unit	△	The point unit for setting whether the interrupt is processed at the rising/falling of input signals has been changed.
Common terminal arrangement		16 points/common (common terminal: TB9,TB18)	16 points/common (common terminal: TB9,TB18)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External connection		20-point terminal block connector (M3×6 screws)	20-point terminal block connector (M3.5×7 screws)	×	
Applicable wire size		0.75 to 1.5mm²	0.75 to 1.25 mm²	×	Wiring must be changed.
Applicable solderless terminal		1.25-3,1.25-YS3A, 2-S3,2-YS3A V1.25-3,V1.25-YS3A, V2-S3,V2-YS3A	R1.25-3.5,R2-3.5, RAV1.25-3.5,RAV2-3.5	×	
Occupied points		32 points (special 32 points)	32 points (special 32 points)	○	
Current consumption		0.14A (TYP. all points ON)	0.057A (TYP. all points ON)	○	
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.40kg	0.20kg	○	

*1 Check the specifications of sensor or switch to connect to the A1SI61.

3.5 Precautions for I/O Module Replacement

(1) Wiring

(a) Size of wire and solderless terminal

The module and terminal block of the small-sized AnS/Q2AS series are smaller than the large-sized A/QnA series, therefore the applicable size of wire and solderless terminal for terminal blocks differ between the two series.
For this reason, use the wire and solderless terminal compatible with the specifications of the small-sized AnS/Q2AS series I/O module when replacing with the small-sized AnS/Q2AS series.

(b) Change from terminal block to connecter

The 32-point I/O modules of the large-sized A/QnA series uses terminal blocks while that of the AnS/Q2AS series uses connecters.
When using a 32-point I/O module of the small-sized AnS/Q2AS series, shift to the wiring using connecters or convert the connecters to terminal blocks with the following method.
· Use the conversion module for the connecters and terminal block.

(2) Connecter for external wiring

When replacing the large-sized A/QnA series A□82 (D sub-connector) with the small-sized AnS/Q2AS series A1S□82, the wiring must be changed since the external wiring connecters included in the package are different.

When directly using a D sub-connector, replace A□82 with A1S□81 (two modules).
However, confirm the wiring condition of the entire system since the number of modules will be increased.

(3) Precautions for input modules

(a) Specifications change of rated input current

Check the specifications of sensors and switches since some of the small-sized AnS/Q2AS series input modules support lower rated input current than those of the large-sized A/QnA series.

(b) Specifications change of OFF current

Check the specifications of sensors and switches since some of the small-sized AnS/Q2AS series input modules support lower OFF current than those of the large-sized A/QnA series.

(c) Specifications change of maximum simultaneous input points

Check the specifications of sensors and switches since some of the small-sized Ans/Q2AS series input modules have less maximum simultaneous input points than those of the large-sized A/QnA series. Refer to the derating diagram and use within the range shown in the diagram when replacing with the small-sized AnS/Q2AS series.

(d) Specifications change of rated voltage value

The A1SX□□-S1 type DC input module of the small-sized AnS/Q2AS series is dedicated to 24VDC and cannot be used at 12VDC.

(e) Specifications change of response time

Pay attention that the response time may differ between the large-sized A/QnA series and the small-sized AnS/Q2AS series.

(f) Specifications change of common terminal arrangement

The common terminal arrangement may differ between the large-sized A/QnA series and the small-sized AnS/Q2AS series. Pay attention when applying a different voltage to each common.

(4) Precautions for output module

(a) Specifications change of output current value

Some of the small-sized AnS/Q2AS series output modules support lower output current than those of the large-sized A/QnA series. Check the specification of the load side when using the small-sized AnS/Q2AS series output module with smaller output current.

(b) Specifications change of common terminal arrangement

The common terminal arrangement may differ between the large-sized A/QnA series and the small-sized AnS/Q2AS series. Pay attention when applying a different voltage to each common.

(c) Specifications change of common maximum load current

Check the maximum load current for one common before use, since the current for one common may differ between the large-sized A/QnA series and the small-sized AnS/Q2AS series.

(d) Specifications change of fuse blow error

On the small-sized AnS/Q2AS series, note that a fuse blow error is detected if the external supply power is not supplied to the output module with a fuse.

4

POWER SUPPLY MODULE REPLACEMENTS

4.1 List of Power Supply Module Alternative Models

A/QnA series model to be discontinued		AnS series alternative models	
Product	Model	Model	Remarks (restrictions)
Power supply module	A61P *	A1S61PN	1) External wiring change: Required 2) Change in number of slots: Not required 3) Change in specifications: Current capacity is smaller.
	A62P	A1S62PN	1) External wiring change: Required 2) Change in number of slots: Not required 3) Change in specifications: Current capacity is smaller.
	A63P *	A1S63P	1) External wiring change: Required 2) Change in number of slots: Not required 3) Change in specifications: Current capacity is smaller.
	A61PEU	A1S61PN	1) External wiring change: Required 2) Change in number of slots: Not required 3) Change in specifications: Current capacity is smaller.
	A62PEU	A1S62PN	1) External wiring change: Required 2) Change in number of slots: Not required 3) Change in specifications: Current capacity is smaller.
	A68P	None	General-purpose switching power supply (For $\pm$15VDC)
	A61P-UL	A1S61PN	1) External wiring change: Required 2) Change in number of slots: Not required 3) Change in specifications: Current capacity is smaller.

* This is not a model to be discontinued.

4.2 Power Supply Module Specifications Comparisons

(1) Specifications comparisons between the A61P(-UL) and the A1S61PN

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A61P(-UL)	A1S61PN	Compati-bility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	
		200-240VAC+10%-15% (170 to 264VAC)		○	
Input frequency		50/60Hz±5%	50/60Hz±5%	○	
Input voltage distortion		5% within	5% within	○	
Max. input apparent power		130VA	105VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	8A	5A	△	Confirm the current consumption of entire system.
	24VDC	—	—	—	
Overcurrent protection	5VDC	8.8A or more	5.5A or more	○	
	24VDC	—	—	—	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	—	—	—	
Efficiency		65% or more	65% or more	○	
Power indicator		Power LED indication	LED indication (5VDC output: ON)	○	
Terminal screw size		M4×0.7×6	M3.5×7	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 2mm^2	○	
Applicable solderless terminal		R1.25-4, R2-4, RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring must be changed.
Applicable tightening torque		98 to 137N·cm	59 to 88N·cm	×	Tighten within the applicable tightening torque.
External dimension		250(H)×55(W)×121(D) mm	130(H)×55(W)×93.6(D) mm	△	
Weight		0.98kg	0.6kg	○	
Allowable momentary power failure period		Within 20ms	Within 20ms	○	
Noise durability		Noise voltage 1500Vp-p	• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC801-4, 2kV	○	
Dielectric withstand voltage		Across external AC terminal batch and ground: 1500VAC for 1minute Across external DC terminal batch and ground: 500VAC for 1minute	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000m)	○	
Insulation resistance		Across external AC terminal batch and ground: 5MΩ or more by 500VDC insulation resistance tester	Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(2) Specifications comparisons between the A62P and the A1S62PN

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A62P	A1S62PN	Compati-bility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	
		200-240VAC+10%-15% (170 to 264VAC)		○	
Input frequency		50/60Hz±5%	50/60Hz±5%	○	
Input voltage distortion		5% within	5% within	○	
Max. input apparent power		155VA	105VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	5A	3A	△	Confirm the current consumption of entire system.
	24VDC	0.8A	0.6A	△	
Overcurrent protection	5VDC	5.5A or more	3.3A or more	○	
	24VDC	1.2A or more	0.66A or more	○	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	—	—	—	
Efficiency		65% or more	65% or more	○	
Power indicator		Power LED indication	LED indication (5VDC output: ON)	○	
Terminal screw size		M4×0.7×6	M3.5×7	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm²	0.75 to 2mm²	○	
Applicable solderless terminal		R1.25-4,R2-4 RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring must be changed.
Applicable tightening torque		48 to 137N·cm	59 to 88N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H)×55(W)×121(D) mm	130(H)×55(W)×93.6(D) mm	△	
Weight		0.94kg	0.6kg	○	
Allowable momentary power failure period		Within 20ms	Within 20ms	○	
Noise durability		Noise voltage 1500Vp-p	• By noise simulator of 1500Vp-p noise voltage, 1 μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC801-4, 2kV	○	
Dielectric withstand voltage		Across external AC terminal batch and ground: 1500VAC for 1minute Across external DC terminal batch and ground: 500VAC for 1minute	Across inputs/LG and outputs/ FG 2830VAC rms/3 cycles (2000m)	○	
Insulation resistance		Across external AC terminal batch and ground: 5MΩ or more by 500VDC insulation resistance tester	Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(3) Specifications comparisons between the A63P and the A1S63P

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A63P	A1S63P	Compati-bility	Precautions for replacement
Input power supply		24VDC+30%-35% (15.6 to 31.2VDC)	24VDC+30%-35% (15.6 to 31.2VDC)	○	
Input frequency		—	—	—	
Input voltage distortion		—	5% within	○	
Max. input apparent power		65W	41W	○	
Inrush current		100A within 1ms	81A within 1ms	○	
Rated output current	5VDC	8A	5A	△	Confirm the current consumption of entire system.
	24VDC	—	—	—	
Overcurrent protection	5VDC	8.5A or more	5.5A or more	○	
	24VDC	—	—	—	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	—	—	—	
Efficiency		65% or more	65% or more	○	
Power indicator		Power LED indication	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 × 7	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm²	0.75 to 2mm²	○	
Applicable solderless terminal		R1.25-4, R2-4, RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring must be changed.
Applicable tightening torque		98 to 137N·cm	59 to 88N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm	130(H) × 55(W) × 93.6(D) mm	△	
Weight		0.8kg	0.5kg	○	
Allowable momentary power failure period		Within 1ms	Within 1ms	○	
Noise durability		Noise voltage 500Vp-p	• By noise simulator of 500Vp-p noise voltage, 1 μs noise width and 25 to 60Hz noise frequency	○	
Dielectric withstand voltage		Across external DC terminal batch and ground: 500VAC for 1 minute	500VAC across primary and 5VDC	○	
Insulation resistance		Across external DC terminal batch and ground: 5MΩ or more by 500VDC insulation resistance tester	5MΩ or more by insulation resistance tester	○	
Accessory		Spare fuse: 1	None	×	Fuses are not included in accessories since they are not replaceable.

(4) Specifications comparisons between the A61PEU and the A1S61PN

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A61PEU	A1S61PN	Compati-bility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	
		200-240VAC+10%-15% (170 to 264VAC)		○	
Input frequency		50/60Hz±5%	50/60Hz±5%	○	
Input voltage distortion		5% within	5% within	○	
Max. input apparent power		130VA	105VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	8A	5A	△	Confirm the current consumption of entire system.
	24VDC	—	—	—	
Overcurrent protection	5VDC	8.8A or more	5.5A or more	○	
	24VDC	—	—	—	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	—	—	—	
Efficiency		65% or more	65% or more	○	
Power indicator		Power LED indication	LED indication (5VDC output: ON)	○	
Terminal screw size		M4×0.7×6	M3.5×7	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm²	0.75 to 2mm²	○	
Applicable solderless terminal		R1.25-4, R2-4, RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring must be changed.
Applicable tightening torque		98 to 137N·cm	59 to 88N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H)×55(W)×121(D) mm	130(H)×55(W)×93.6(D) mm	△	
Weight		0.8kg	0.6kg	○	
Allowable momentary power failure period		Within 20ms	Within 20ms	○	
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	• By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC801-4, 2kV	○	
Dielectric withstand voltage		Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000m)	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000m)	○	
Insulation resistance		Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10MΩ or more by 500VDC insulation resistance tester	Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(5) Specifications comparisons between the A62PEU and the A1S62PN

○: Compatible, △: Partial change required, ×: Incompatible

Specification		A62PEU	A1S62PN	Compati-bility	Precautions for replacement
Input power supply		100-120VAC+10%-15% (85 to 132VAC)	100-240VAC+10%-15% (85 to 264VAC)	○	
		200-240VAC+10%-15% (170 to 264VAC)		○	
Input frequency		50/60Hz± 5%	50/60Hz± 5%	○	
Input voltage distortion		5% within	5% within	○	
Max. input apparent power		110VA	105VA	○	
Inrush current		20A within 8ms	20A within 8ms	○	
Rated output current	5VDC	5A	3A	△	Confirm the current consumption of entire system.
	24VDC	0.8A	0.6A	△	
Overcurrent protection	5VDC	5.5A or more	3.3A or more	○	
	24VDC	1.2A or more	0.66A or more	○	
Overvoltage protection	5VDC	5.5 to 6.5V	5.5 to 6.5V	○	
	24VDC	—	—	—	
Efficiency		65% or more	65% or more	○	
Power indicator		Power LED indication	LED indication (5VDC output: ON)	○	
Terminal screw size		M4 × 0.7 × 6	M3.5 × 7	×	Wiring must be changed.
Applicable wire size		0.75 to 2mm²	0.75 to 2mm²	○	
Applicable solderless terminal		RAV1.25-4, RAV2-4	RAV1.25-3.5, RAV2-3.5	×	Wiring must be changed.
Applicable tightening torque		118N·cm	59 to 88N·cm	×	Tighten within the applicable tightening torque.
External dimensions		250(H) × 55(W) × 121(D) mm	130(H) × 55(W) × 93.6(D) mm	△	
Weight		0.9kg	0.6kg	○	
Allowable momentary power failure period		Within 20ms	Within 20ms	○	
Noise durability		• By noise simulator of 1500Vp-p noise voltage, 1 μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	• By noise simulator of 1500Vp-p noise voltage, 1 μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC801-4, 2kV	○	
Dielectric withstand voltage		Across inputs/LG and outputs/FG 2830VAC rms/3 cycles(2000m)	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000m)	○	
Insulation resistance		Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10MΩ or more by 500VDC insulation resistance tester	Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG10MΩ or more by 500VDC insulation resistance tester	○	
Accessory		Spare fuse: 1 Short chip for applied voltage select terminal: 1	None	×	Fuses are not included in accessories since they are not replaceable, nor are short chip since it is unnecessary to switch operating voltage.

(6) Specifications of the A68P

Specification		A68P
Input power supply		100-120VAC+10%-15% (85 to 132VAC)
		200-240VAC+10%-15% (170 to 264VAC)
Input frequency		50/60Hz±5%
Input voltage distortion		—
Max. input apparent power		95VA
Inrush current		20A within 8ms
Rated output current	+15VDC	1.2A
	-15VDC	0.7A
Overcurrent protection	+15VDC	1.64A or more
	-15VDC	0.94A or more
Efficiency		65% or more
Power indicator		Power LED indication
Power ON indicator		Contact output
		Switched on if +15VDC output is +14.25V or higher or -15VDC output is -14.25V or lower.
		Min. contact switching load: 5VDC, 10mA Max. contact switching load: 264VAC, 2A (R load)
Terminal screw size		M3×0.5×6
Applicable wire size		0.75 to 2mm^2
Applicable solderless terminal		V1.25-4, V1.25-YS4A, V2-S4, V2-YS4A
Applicable tightening torque		68N·cm
External dimensions		250(H)×75.5(W)×121(D) mm
Weight		0.9kg

Substitute the general-purpose switching power supply, whose specifications are shown below, for the A68P. Choose current capacity with the result of calculating the current consumption of entire system to be used.

Specification	General-purpose Switching Power Supply
Voltage	+15VDC±3%(14.55V to 15.45V)
	-15VDC±3%(-14.55V to -15.45V)
Ripple voltage	50mVp-p or less
Spike voltage	100mVp-p or less
Output voltage limit	Within ±1V

4.3 Precautions for Power Supply Module Replacement

(1) Power supply module selection

Current consumption differs between the AnS series and A series modules. Select the power supply module with the result of calculating the current consumption of entire system.

(2) Wiring

Applicable wire and crimping terminals for terminal blocks differ between the AnS series and the A series. Use the wire and crimping terminals compatible with the specifications.

5 BASE UNIT AND EXTENSION CABLE REPLACEMENT

5.1 List of Alternative Models for Base Unit and Extension Cable

Large-sized A/QnA series model to be discontinued		Small-sized AnS/Q2AS series alternative model	
Product	Model	Model	Remarks (restrictions)
Main base unit	A32B	A1S32B	
	A35B	A1S35B	
	A38B	A1S38B	
	A38B-UL	A1S38B	
	A32B-E	A1S32B-E	
	A35B-E	A1S35B-E	
	A38B-E	A1S38B-E	
	A32B-S1	A1S32B	
	A38HB	A1S38HB	Cannot be used for the A2USHCPU-S1.
	A38HBEU	A1S38HBEU	Cannot be used for the A2USHCPU-S1.
Extension base unit	A52B	A1S52B	
	A55B	A1S55B	
	A58B	A1S58B	
	A62B	A1S65B	Change in number of I/O slots: 2 slots → 5 slots
	A65B	A1S65B	
	A68B	A1S68B	
	A68B-UL	A1S68B	
Extension cable	AC06B	A1SC07B	Cable length: 0.6m → 0.7m
	AC12B	A1SC12B	
	AC30B	A1SC30B	
	AC50B	A1SC60B	Cable length: 5.0m → 6.0m
	A1SC05NB	A1SC07B	Cable length: 0.45m → 0.7m
	A1SC07NB	A1SC07B	
	A1SC30NB	A1SC30B	
	A1SC50NB	A1SC60B	Cable length: 5.0m → 6.0m

5.2 Base Unit and Extension Cable Specifications Comparisons

5.2.1 Base unit specifications comparisons

(1) Main base unit

(a) Comparisons between the A32B(-E) and the A1S32B(-E)

Item	Type		Precautions for replacement
	Large-sized A/QnA series	**Small-sized AnS/Q2AS series**	
	A32B(-E)	**A1S32B(-E)**	
Loaded I/O modules	2 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Cannot connect extension modules.	Extendable	
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimension	250(H) × 247(W) × 29(D)mm	130(H) × 220(W) × 28(D)mm	
Dimension for mounting to the panel	227 × 200mm	200 × 110mm	

(b) Comparisons between the A32B-S1 and the A1S32B

Item	Type		Precautions for replacement
	Large-sized A/QnA series	**Small-sized AnS/Q2AS series**	
	A32B-S1	**A1S32B**	
Loaded I/O modules	2 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable		
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 268(W) × 29(D)mm	130(H) × 220(W) × 28(D)mm	
Dimensions for mounting to the panel	248 × 200mm	200 × 110mm	

(c) Comparisons between the A35B(-E) and the A1S35B(-E)

Item	Type		Precautions for replacement
	Large-sized A/QnA series	**Small-sized AnS/Q2AS series**	
	A35B(-E)	**A1S35B(-E)**	
Loaded I/O modules	5 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable		
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 382(W) × 29(D)mm	130(H) × 325(W) × 28(D)mm	
Dimensions for mounting to the panel	362 × 200mm	305 × 110mm	

(d) Comparisons between the A38(-E/-UL)/A38HB/A38HBEU and the A1S38B(-E)/A1S38HB/A1S38HBEU

Item	Type		Precautions for replacement
	Large-sized A/QnA series	**Small-sized AnS/Q2AS series**	
	A38B(-E/-UL)/A38HB/ A38HBEU	**A1S38B(-E)/A1S38HB/ A1S38HBEU**	
Loaded I/O modules	8 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable		
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 480(W) × 29(D)mm	130(H) × 430(W) × 28(D)mm	
Dimensions for mounting to the panel	460 × 200mm	410 × 110mm	

(2) Extension base unit (No power supply module required)

(a) Comparisons between the A52B and the A1S52B

Item	Type		Precautions for replacement
	Large-sized A/QnA series	Small-sized AnS/Q2AS series	
	A52B	**A1S52B**	
Loaded I/O modules	2 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable	Cannot connect extension modules.	
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 183(W) × 29(D)mm	130(H) × 155(W) × 28(D)mm	
Dimensions for mounting to the panel	163 × 200mm	135 × 110mm	

(b) Comparisons between the A55B and the A1S55B

Item	Type		Precautions for replacement
	Large-sized A/QnA series	Small-sized AnS/Q2AS series	
	A55B	**A1S55B**	
Loaded I/O modules	5 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable	Cannot connect extension modules.	
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 297(W) × 29(D)mm	130(H) × 260(W) × 28(D)mm	
Dimensions for mounting to the panel	277 × 200mm	240 × 110mm	

(c) Comparisons between the A58B and the A1S58B

Item	Type		Precautions for replacement
	Large-sized A/QnA series	Small-sized AnS/Q2AS series	
	A58B	**A1S58B**	
Loaded I/O modules	8 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable	Cannot connect extension modules.	
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 411(W) × 29(D)mm	130(H) × 365(W) × 28(D)mm	
Dimensions for mounting to the panel	391 × 200mm	345 × 110mm	

(3) Extension base unit (Power supply module loaded)

(a) Comparisons between the A62B and the A1S65B

Item	Type		Precautions for replacement
	Large-sized A/QnA series	**Small-sized AnS/Q2AS series**	
	A62B	**A1S65B**	
Loaded I/O modules	2 can be loaded.	5 can be loaded.	Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable	Cannot connect extension modules.	
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 283(W) × 29(D)mm	130(H) × 315(W) × 28(D)mm	
Dimensions for mounting to the panel	218 × 200mm	295 × 110mm	

(b) Comparisons between the A65B and the A1S65B

Item	Type		Precautions for replacement
	Large-sized A/QnA series	**Small-sized AnS/Q2AS series**	
	A65B	**A1S65B**	
Loaded I/O modules	5 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable	Cannot connect extension modules.	
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 352(W) × 29(D)mm	130(H) × 315(W) × 28(D)mm	
Dimensions for mounting to the panel	332 × 200mm	295 × 110mm	

(c) Comparisons between the A68B (-UL) and the A1S68B

Item	Type		Precautions for replacement
	Large-sized A/QnA series	**Small-sized AnS/Q2AS series**	
	A68B(-UL)	**A1S68B**	
Loaded I/O modules	8 can be loaded.		Refer to Section 5.3.1 for replacement precautions.
Extension availability	Extendable	Cannot connect extension modules.	
Mounting hole size	ϕ 6 mm dia. pear-shaped hole (for M5 screw)		
External dimensions	250(H) × 466(W) × 29(D)mm	130(H) × 420(W) × 28(D)mm	
Dimensions for mounting to the panel	446 × 200mm	400 × 110mm	

5.2.2 Extension cables specifications comparisons

Item		Type			Precautions for replacement
		Large-sized A/QnA series		**Small-sized AnS/Q2AS series**	
		A Main-A Extension	**AnS Main-A Extension**	**AnS Main-AnS Extension**	
Cable length	0.45m	—	A1SC05NB	A1SC07B	Refer to Section 5.3.2 for replacement precautions.
	0.6m	AC06B	—	A1SC07B	
	0.7m	—	A1SC07NB	A1SC07B	
	1.2m	AC12B	—	A1SC12B	
	3.0m	AC30B	A1SC30NB	A1SC30B	
	5.0m	AC50B	—	A1SC60B	
	5.0m	—	A1SC50NB	A1SC60B	

5.3 Precautions for Base Unit and Extension Cable Replacement

5.3.1 Precautions for base unit replacement

(1) Installation dimensions

When replacing the large-sized A/QnA series base unit with the small-sized AnS/Q2AS series, it is necessary to rework the mounting holes to fix the unit to a control panel, since the two series have different mounting hole size.

(2) Number of extension stages

For the small-sized AnS/Q2AS series, up to one stage of the extension base unit is applicable. If the extension stages are two stages or more, consider replacing by the Q series.

5.3.2 Precautions for extension cable replacement

(1) Total extension distance of extension cable

The total extension distance of the small-sized AnS/Q2AS series extension cable is up to 6.0m while that of the large-sized A/QnA series is 6.6m. Select a suitable cable according to your system.

6

MEMORY AND BATTERY REPLACEMENT

6.1 List of Alternative Models for Memory

(1) Large-sized A series

Large-sized A series model to be discontinued		Small-sized AnS series alternative model	
Product	Model	Model	Remarks (restrictions)
Memory cassette	A3NMCA-0	Unnecessary	Built-in RAM is the alternative. For ROM operation, the A2SNMCA-30KE is required.
	A3NMCA-2	Unnecessary	
	A3NMCA-4	Unnecessary	
	A3NMCA-8	Unnecessary	
	A3NMCA-16	Unnecessary	
	A3NMCA-24	Unnecessary	
	A3NMCA-40	Unnecessary	
	A3NMCA-56	Unnecessary	
	A3AMCA-96	Unnecessary	
	A4UMCA-128	Unnecessary	
	A4UMCA-8E	Unnecessary	
	A4UMCA-32E	Unnecessary	
	A4UMCA-128E	Unnecessary	
IC-RAM memory	4KRAM	Unnecessary	Built-in RAM is the alternative.
E^{2}PROM memory	4KEROM	A2SNMCA-30KE	Use the memory cassette.
EPROM memory	4KROM *1	A2SNMCA-30KE	Use the memory cassette.
	8KROM *1		
	16KROM *1		
	32KROM		
	64KROM		

*1 Will be discontinued in the end of September, 2008.

(2) Large-sized QnA series

Large-sized QnA series model to be discontinued		Small-sized Q2AS series alternative model	
Product	Model	Model	Remarks (restrictions)
IC memory card	Q1MEM-64S	Q1MEM-64S	No. of IC memory cards is changed from two to one.
	Q1MEM-128S	Q1MEM-128S	
	Q1MEM-256S	Q1MEM-256S	
	Q1MEM-512S	Q1MEM-512S	
	Q1MEM-1MS	Q1MEM-1MS	
	Q1MEM-2MS	Q1MEM-2MS	
	Q1MEM-64SE	Q1MEM-64SE	
	Q1MEM-128SE	Q1MEM-128SE	
	Q1MEM-256SE	Q1MEM-256SE	
	Q1MEM-512SE	Q1MEM-512SE	
	Q1MEM-1MSE	Q1MEM-1MSE	

6.2 Precautions for Memory and Battery Replacement

(1) Precaution for memory replacement

    (a) Necessity of memory cassette

        The A2USHCPU-S1 does not need memory cassettes for the RAM operation, since its CPU module incorporates the built-in RAM. For the ROM operation, the memory cassette of the A2SNMCA-30KE is needed.

    (b) Memory capacity

        If the memory capacities are insufficient depending on types of CPU module or memory cassette after the replacement, consider replacing by the Q series. For the memory capacity and configurations used on CPU module, refer to Section 2.4.1.

(2) Precaution for battery replacement

    All the batteries (A6BAT) for the large-sized A/QnA series and small-sized AnS/Q2AS series are common.
Refer to the users manual of each CPU module for battery life, since it varies depending on the type of CPU module and memory cassette.

7 PROGRAM REPLACEMENT

This chapter explains how to replace (reuse) the programs and comments of the large-sized A/QnA series CPU with the small-sized AnS/Q2AS series, and precautions for the replacement.

(1) Comparisons between the large-sized A series CPU and the A2USHCPU-S1

◯: Compatible, △: Partial change required, ✕ : Incompatible

Item		Large-sized A series CPU specification	The A2USHCPU-S1 specification and precautions for replacement	Compati-bility	Reference section
Sequence program	Main	• Main program is required. • Sub programs, if included, are switched with the CHG instructions. • The SFC is dealt as the microcomputer program of main program.	[Specification] • Only main and SFC programs [Measure] • The sequence program of Sub 1 to 3 must be added to the main program. If the program exceeds 30k steps after the addition, consider replacing by the QCPU.	△	—
	Sub 1				
	Sub 2				
	Sub 3				
	SFC				
Microcomputer program		• A user-created microcomputer program and the microcomputer program of the utility package are available for the AnNCPU.	[Specification] • Creating microcomputer program is not possible. [Measure] • Since the AnNCPU user-created microcomputer program cannot be performed, consider replacing the microcomputer program with sequence program or the A2SHCPU in which the execution is possible. • For the utility packages instructions, correct them equivalent to the corresponding instructions of the A2USHCPU-S1.	△	—
Instruction		• For the A3N, A3A, A3U, A4UCPU, the display instructions (LED instruction, etc.) are available.	[Specification] • The display instructions (LED, LEDA, LEDB, LEDC) cannot be used. [Measure] • The display instructions (LED, LEDA, LEDB, LEDC) must be deleted.	△	—
File register		• Storage area is reserved in a memory cassette. • One block is set in 4k or 8k-point units.	[Specification] • Data is stored in the built-in RAM. • One block is set in 8k-point units.	△	Section 7.3.4

○: Compatible, △: Partial change required, ×: Incompatible

Item	Large-sized A series CPU specification	The A2USHCPU-S1 specification and precautions for replacement	Compati-bility	Reference section
Timer, Counter	• Timer and counter are processed with the END processing.	[Specification] • Same specifications	○	—
Parameter	• Parameters are dedicated for each CPU.	[Specification] • Each CPU has the dedicated parameters. [Measure] • When replacing by the A2USHCPU-S1, check and reset the parameters since specifications and functions differ between the two CPUs.	△	Section 7.2.1
Special relay	• 256 points of M9000 to M9255 are provided.	[Specification] • Same specifications	○	—
Special register	• 256 points of D9000 to D9255 are provided.	[Specification] • Same specifications	○	—
Comment	• Comments are managed as a common comment or comment by program. • The comment capacity of the ACPU is up to 127k (64k + 63k) bytes.	[Specification] • Same specifications	○	—
Writing programs to ROM	• The ROM operation is executed with the EPROM.	[Specification] • The E^{2}PROM cassette is installed to the CPU, and the ROM operation is executed. [Measure] • By replacing by E^{2}PROM, writing to PLC can be made by the operation equivalent to that of RAM.	△	Section 7.3.5

(2) Comparisons between the large-sized QnA series CPU and the small-sized Q2AS series CPU

Item	Large-sized QnA series CPU specification	Small-sized Q2AS series CPU specifications and precautions for replacement	Compati-bility	Reference section
Sequence program SFC program	• Each program is dealt as one file.	[Specification] • Same specifications	○	—
Instruction	• Each instruction described in the QCPU (Q mode)/QnACPU Programming Manual (Common Instructions/PID Control Instructions/SFC, etc.) is usable.	[Specification] • Same specifications	○	—
File register	• Data is stored in a memory card. • One block is set in 32K-point units. • Up to two memory cards can be installed.	[Specification] • Same specifications, and one memory card can be installed. [Measure] • Review the setting since the number of memory cards differs between the two CPUs.	△	Section 7.3.4
Parameter	• Each CPU has the dedicated parameters.	[Specification] • Same specifications	○	—
Special relay	• 1800 points of SM0 to SM1799 are provided.	[Specification] • Same specifications	○	—
Special register	• 1800 points of SD0 to SD1799 are provided.	[Specification] • Same specifications	○	—
Comment	• Comments are managed as a common comment or comment by program.	[Specification] • Same specifications	○	—
Writing programs to ROM	• The boot run is executed with storing a program and parameter in a memory card. • Up to two memory cards can be installed.	[Specification] • Same specifications, and one memory card can be installed. [Measure] • Review the setting since the number of memory cards differs between the two CPUs.	△	Section 7.3.5

7.1 Program Replacement Procedure

The programs and comments of the large-sized A/QnA series CPU can be replaced with the small-sized AnS/Q2AS series by using "Change PLC type" of the GX Developer.

7.1.1 Change PLC type operation

The Change PLC type is a function that changes the target PLC type of the data read to the GX Developer.
For special function modules and network modules, review programs and parameters.

(1) Applicable range of conversion from the A/QnACPU by the GX Developer

The following table shows the applicable range of conversion from the A/QnACPU to other PLCs. As it shows, converting to all PLC CPUs is applicable.

Product	Change source PLC	Change destination PLC		
		ACPU	QnACPU	QCPU
GX Developer	ACPU	○	○	○
	QnACPU	○	○	○

(2) Operation of GX Developer

  (a) Select the "Change PLC type" of the "Project" menu.
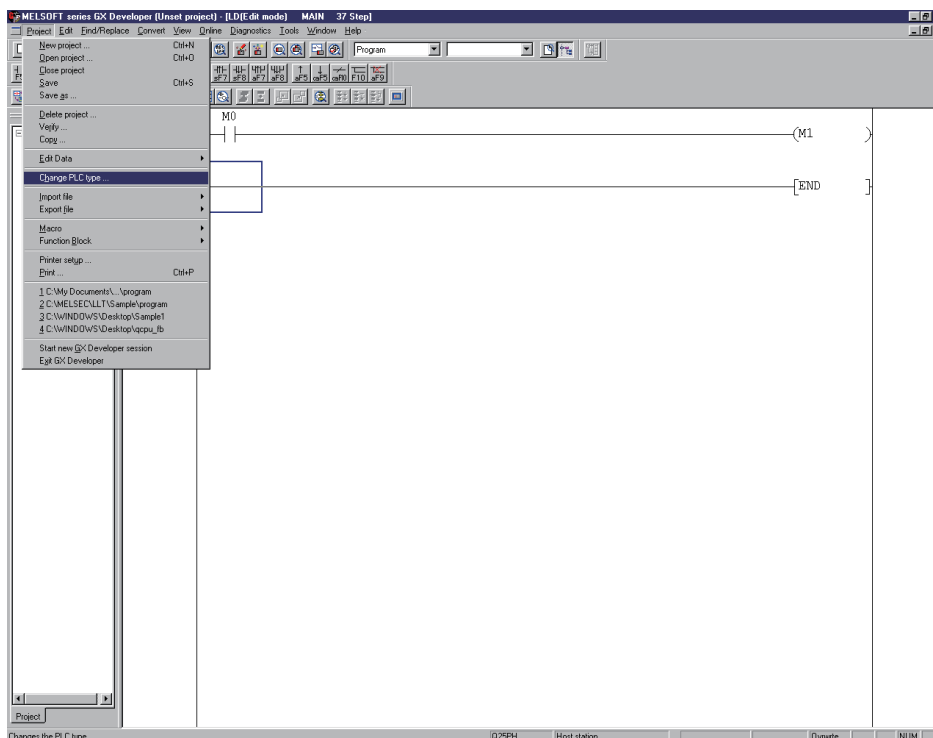
(b) Specify the PLC type after conversion in the "Change PLC type" dialog box.
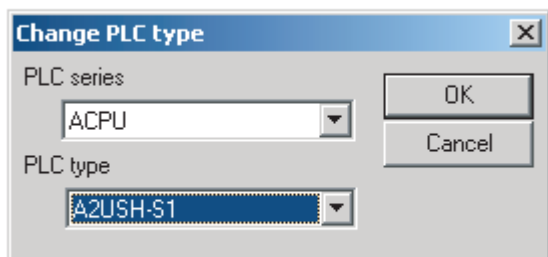
Click the [OK] button after setting the PLC type.

PLC series setting

PLC type setting
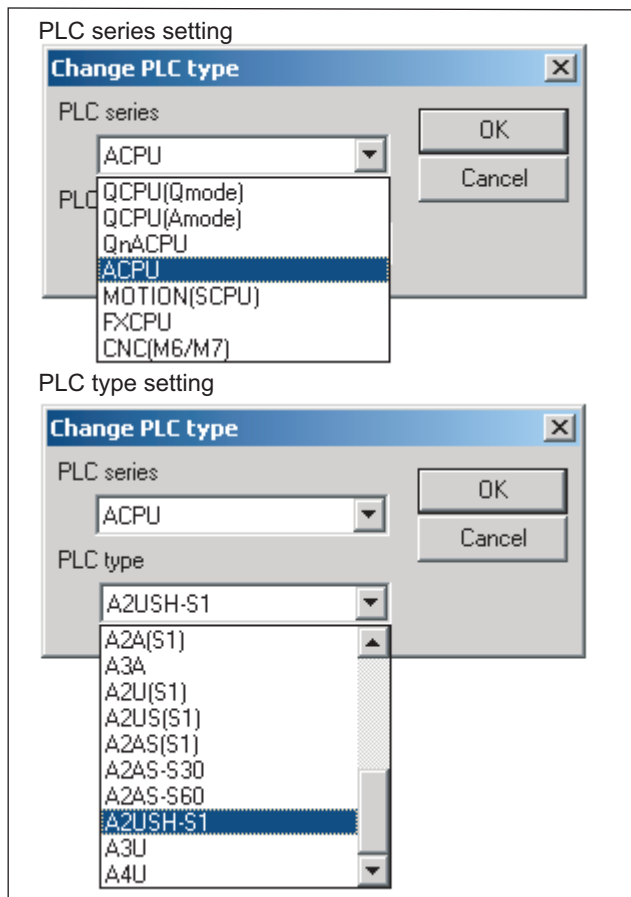
7.1.2 Reading (Reusing) other format files

The following explains how to read (reuse) GPPQ/GPPA format files other than that of the GX Developer. Follow this procedure to convert them to the file format of the GX Developer.

(1) Operation procedure

Select [Project] → [Import file] ┬─→ [Import from GPPQ format file]
                                 └─→ [Import from GPPA format file]

(2) Setting screen
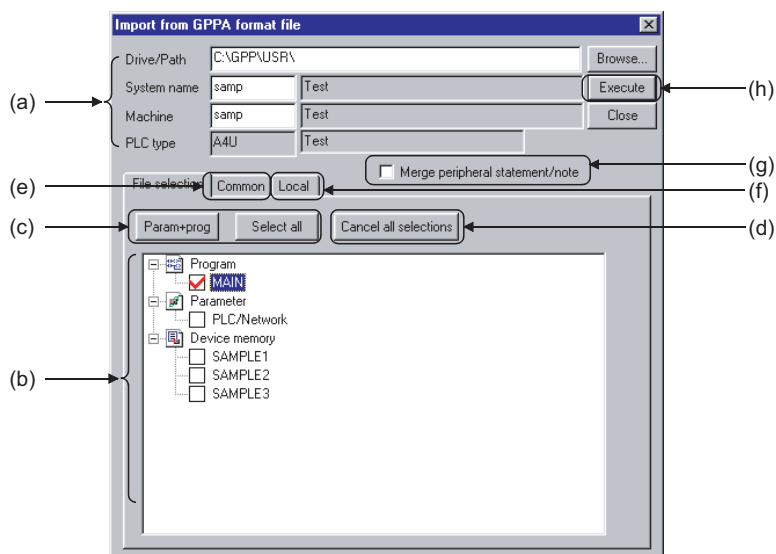
(a) Drive/Path, System name, Machine

Designates the location of data created in GPPQ or GPPA format.
Enter the system name and machine name of the data specified in the Drive/Path.
Clicking the [Browse] button shows the dialog box for choosing the system name and machine name. Double-click the file to be read to specify it.

(b) Source data list

Displays data created in GPPQ or GPPA format.
Check the checkbox of data name.
For the selected comments, the device comment range to be read can be set in the Common tab or Local tab.

(c) [Param+prog] button/[Select all] button

- [Param+prog] button
  Select only the parameter data and program data of the source data.

- [Select all] button
  Select all data in the source data list.
  Comment2 is selected for the A series, and the device memories of the number of data are displayed.
  The first data name is selected for comments and file registers in the QnA series.

(d) [Cancel all selections] button

Cancels all the selected data.

(e) <<Common>> tab screen (A series)

Set this when specifying the range for common comments and reading data.
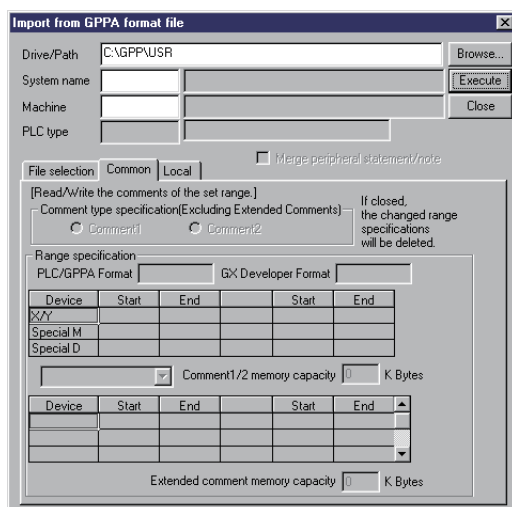
(f) <<Local>> tab screen (A series)

Set this when specifying the range for comments by program and reading data.
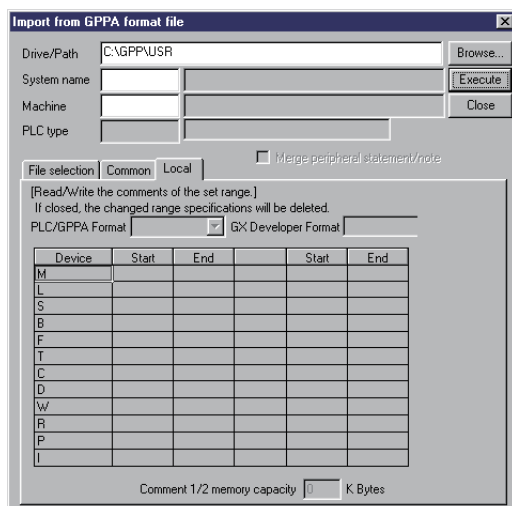
(g) Merge peripheral statement/note

(h) [Execute] button

Click this button after making the setting.

(3) Setting procedure

(a) Data selection

1) Set a drive/path for reading in GPPQ or GPPA format.
2) Click the [Browse] button to set the system name and machine name of the project to be read.
3) Check the checkbox of the data to be selected with the [Param+prog] button, [Select all] button, or the mouse.
4) Click the [Execute] button after making necessary settings.

(b) Canceling data selection

1) When canceling the selected data arbitrarily:
   Clear the checkmark (✓) in the checkbox with the mouse or space key.
2) When canceling all the selected data:
   Click the [Cancel all selections] button.

(4) Precautions for reading the other format files

For A series	
A6GPP, SW0S-GPPA format data	Read data with the GX Developer after performing the corresponding format conversion with GPPA. For the operating methods, refer to the Type SW4IVD-GPPA(GPP) Operating Manual.
For data selection	For device comment selection, you can only choose either comment 2 or comment 1.
GPPA format file reading	Deletes the project data on the GX Developer and reads the other format file. The area in excess of the program capacity is deleted when read. For the PLC type which cannot use subprograms, subprograms are deleted when read. When the file includes microcomputer programs edited with other than the SFC program (e.g. SW0SRX-FNUP), they are lost.

For QnA series	
Ladder return positions	Returning places are different between GPPQ and GX Developer. Because of this, if the total of return sources and return destinations exceeds 24 lines in a single ladder block, the program is not displayed properly. Corrective action: Add SM400 (normally ON contact) to adjust the return positions.
For data selection	For the device memory and file register, you can select only one data name for each item.

7.2 Precautions for Parameter Replacement

7.2.1 Conversion from large-sized A series CPU to small-sized AnS series CPU

This section explains the parameter conversion upon replacement of the large-sized A series CPU programs with the small-sized AnS series CPU.

<Compatibility>
　○:Common item between the large-sized A series CPU and the small-sized AnS series CPU, that can be converted directly.
　△:Item that requires re-setting after the conversion, since the functions/specifications are partially different
　×:Items to be deleted, since there is no common item between the large-sized A series and the small-sized AnS series CPU

Confirm the parameters after the conversion, and correct/reset as required.

(1) When replacing the AnNCPU by the A2USHCPU-S1

<table>
<tr><th colspan="3">Name</th><th>Compati-bility</th><th>Remarks</th></tr>
<tr><th colspan="3"></th><th></th><th>When replacing the AnNCPU by the A2USHCPU-S1</th></tr>
<tr><td rowspan="16">PLC parameter</td><td rowspan="5">Memory capacity</td><td>Program capacity</td><td>△</td><td>Main microcomputer program capacity is dedicated to the SFC.
Sub microcomputer program capacity is not converted.</td></tr>
<tr><td>Comment</td><td>○</td><td rowspan="3">Can be converted directly.</td></tr>
<tr><td>Expanded comment</td><td>○</td></tr>
<tr><td>File register</td><td>○</td></tr>
<tr><td>Capacity for debugging</td><td>×</td><td>Not converted since it is the online setting.</td></tr>
<tr><td rowspan="3">PLC RAS</td><td>WDT (watchdog timer) setting</td><td>△</td><td>Not converted since fixed to 200ms.</td></tr>
<tr><td>Operation mode when these is an error</td><td>△</td><td>Since the setting is converted to default, resetting is required when the setting has been changed.</td></tr>
<tr><td>Annunciator display mode</td><td>×</td><td>No compatible function is available.</td></tr>
<tr><td rowspan="4">PLC system</td><td>RUN - PAUSE contacts</td><td>△</td><td>Resetting is required since the setting is converted to default.</td></tr>
<tr><td>System interrupt settings</td><td>△</td><td>The caution is required since the specifications differ.</td></tr>
<tr><td>Output mode at STOP to RUN</td><td>△</td><td>Resetting is required since the setting is converted to default.</td></tr>
<tr><td>Data communications request batch processing</td><td>—</td><td>The new AnUCPU function</td></tr>
<tr><td colspan="2">I/O assignment</td><td>△</td><td>Resetting is required since the setting is not converted.</td></tr>
<tr><td colspan="2">Device</td><td>△</td><td>Resetting is required since the setting is converted to default.</td></tr>
</table>

Name			Compatibility	Remarks
				When replacing the AnNCPU by the A2USHCPU-S1
Network parameter	MELSECNET (II) network parameter	Master station parameter	Network type	○	Can be converted directly.
			Start I/O No.	△	The I/O No. of module installed must be changed since the start I/O No. is set to the default value of "00".
			Total stations	○	Can be converted directly.
			Network range assignment	○	
			Refresh parameters	△	New setting is required. For 3-tier master station, the setting is required including the link range of 2-tier local station.
		Local station parameter	Network type	△	New settings for the network type and start I/O No. are required. If there is no 3-tier master station, the refresh parameter setting is also required.
			Start I/O No.	△	
			Refresh parameters	△	
	MELSECNET/MINI parameter			△	The AnU and A2USHCPU-S1 can be set in the program and the parameter. The AnNCPU program can be diverted and does not require modification. For changing to the parameter setting, a new setting is required.

(2) When replacing the AnACPU by the A2USHCPU-S1

		Name	Compatibility	Remarks
				When replacing the AnACPU by the A2USHCPU-S1
PLC parameter	Memory capacity	Program capacity	○	Can be converted directly.
		Comment	○	
		Expanded comment	○	
		File register	○	
		Capacity for debugging	○	Since it is the online setting, parameter setting is not required.
	PLC RAS	WDT (watchdog timer) setting	○	Fixed to 200ms.
		Operation mode when these is an error	○	Can be converted directly.
		Annunciator display mode	×	No compatible function is available.
	PLC system	RUN - PAUSE contacts	○	Can be converted directly.
		System interrupt settings	○	
		Output mode at STOP to RUN	○	
		Data communications request batch processing	—	The new AnUCPU function
	I/O assignment		○	Can be converted directly.
	Dev. Point		○	

			Name	Compati-bility	Remarks
					When replacing the AnACPU by the A2USHCPU-S1
Network parameter	MELSECNET (II) network parameter	Master station parameter	Network type	○	Can be converted directly.
			Start I/O No.	△	The I/O No. of module installed must be changed since the start I/O No. is set to the default value of "00".
			Total stations	○	Can be converted directly.
			Network range assignment	○	
			Refresh parameters	△	New setting is required. For 3-tier master station, the setting is required including the link range of 2-tier local station.
		Local station parameter	Network type	△	New settings for the network type and start I/O No. are required. If there is no 3-tier master station, the refresh parameter setting is also required.
			Start I/O No.	△	
			Refresh parameters	△	
	MELSECNET/MINI parameter			○	Can be converted directly.

(3) When replacing the AnUCPU by the A2USHCPU-S1

Name			Comati-bility	Remarks
				When replacing the AnUCPU by the A2USHCPU-S1
PLC parameter	Memory capacity	Program capacity	○	Can be converted directly.
		Comment	○	
		Expanded comment	○	
		File register	○	
		Capacity for debugging	○	Since this is the online setting, parameter setting is not required.
	PLC RAS	WDT (watchdog timer) setting	○	Fixed to 200ms.
		Operation mode when these is an error	○	Can be converted directly.
		Annunciator display mode	×	No compatible function is available.
	PLC system	RUN - PAUSE contacts	○	Can be converted directly.
		System interrupt settings	○	
		Output mode at STOP to RUN	○	
		Data communications request batch processing	○	
	I/O assignment		○	
	Dev. Point		○	

Name			Compati-bility	Remarks
				When replacing the AnUCPU by the A2USHCPU-S1
Network parameter	MELSECNET (II) network parameter	Master station parameter	Network type	○	Can be converted directly.
			Start I/O No.	○	
			Total stations	○	
			Network range assignment	○	
			Refresh parameters	○	
		Local station parameter	Network type	○	
			Start I/O No.	○	
			Refresh parameters	○	
	MELSECNET/10 network parameter		Start I/O No.	○	
			Network No.	○	
			Total of link device (slave) stations	○	
			Refresh parameters	○	
			Network range assignment	○	
			Station inherent parameters	○	
			I/O assignment	○	
			Transfer between link devices	○	
			Routing parameters	○	
	MELSECNET/MINI parameter			○	

7.2.2 Conversion from large-sized QnA series CPU to small-sized Q2AS series CPU

This section explains the parameter conversion upon replacement of the large-sized QnA series CPU programs with the small-sized Q2AS series CPU.
The symbols in the table indicate the followings.

<Compatibility>
○ :Common item between the large-sized QnA series CPU and the small-sized Q2AS series CPU, that can be converted directly.

△ :Item that requires re-setting after the conversion, since the functions/specifications are partially different

× :Items to be deleted, since there is no common item between the large-sized QnA series CPU and the small-sized Q2AS series CPU

Confirm the parameters after the conversion, and correct/re-set as required.

Name			Compati-bility	Remarks
PLC parameter	PLC name		○	Can be converted directly.
	PLC system	Timer limit setup	○	
		RUN - PAUSE contacts	○	
		Remote reset	○	
		Output mode at STOP to RUN	○	
		Common pointer	○	
		General data processing	○	
		Number of empty slots	○	
		System interrupt settings	○	
	PLC file	File register	○	
		Comment file used in a command	○	
		Device initial value	○	
		File for local device	○	
	Device		○	
	PLC RAS	WDT (watchdog timer) setting	○	
		Error check	○	
		Operation mode when these is an error	○	
		Constant scanning	○	
		Annunciator display mode	○	
		Brakedown history	○	
		Low speed program execution time	○	
	I/O assignment		○	
	Program		○	
	Boot file		○	
	SFC	SFC program start mode	○	
		Start conditions	○	
		Operation mode when the block is stopped	○	
	Acknowledge X/Y assignment		○	

	Name	Compati-ibility	Remarks
Network parameter	MELSECNET/Ethernet	○	Can be converted directly.
	MELSECNET/MINI	○	
	CC-Link	○	

7.3 Precautions for Program Replacement

7.3.1 List of applicable devices

Device name		QnACPU	Q2AS(H)CPU-(S1)	
Number of I/O points[*1]		Q2A: 512 points Q2A-S1: 1024 points Q3A: 2048 points Q4A: 4096 points	Q2AS: 512 points Q2AS-S1: 1024 points Q2ASH: 512 points Q2ASH-S1: 1024 points	
Number of I/O device points[*2]		8192 points		
Internal relay		8192 points[*3]		
Latch relay		8192 points[*3]		
Step relay	Sequence program	—		
	SFC	8192 points (512 points/block)		
Annunciator		2048 points[*3]		
Edge relay		2048 points[*3]		
Link relay		8192 points[*3]		
Special relays for link		2048 points		
Timer		2048 points[*3]		
Retentive timer		0 points[*3]		
Counter		1024 points[*3]		
Data register		12288 points[*3]		
Link register		8192 points[*3]		
Link special register		2048 points		
Function input		16 points (FX0 to FXF)[*4]		
Function output		16 points (FX0 to FXF)[*4]		
Special relay		2048 points		
Function register		5 points (FD0 to FD4)		
Special register		2048 points		
Link direct device		Specified from J□\G□		
Special direct device		Specified from U□\G□		
Index register	Z	16 points (Z0 to Z15)		
	V[*5]	—		
File register		32768 points/block (R0 to R32767)		
Accumulator		—		
Nesting		15 points		
Pointer		4096 points		
Interrupt pointer		48 points		
SFC block		320 points		
SFC transition device		512 points/block		
Decimal constant		K-2147483648 to K2147483647		
Hexadecimal constant		H0 to HFFFFFFFF		
Real constant		E±1.17550-38 to E±3.40282+38		
Character string		"QnACPU", "ABCD"		

*1   The number of accessible points to actual I/O modules.
*2   The number of points that can be used on the programs.
*3   The number of points used can be changed with parameters.
*4   Each 5 points of FX0 to FX4 and FY0 to FY4 can be used on the programs.
*5   "V" is used for edge relays for the QnACPU.

A2USHCPU-S1	AnUCPU	AnACPU	AnNCPU
A2USH-S1: 1024 points	A2U: 512 points A2U-S1: 1024 points A3U: 2048 points A4U: 4096 points	A2A: 512 points A2U-S1: 1024 points A3A: 2048 points	A1N: 256 points A2N: 512 points A2N-S1: 1024 points A3N: 2048 points
8192 points		Same I/O device points of each CPU module	
Total 8192 points[3]			Total 2048 points[3]
—			
2048 points			256 points
—			
8192 points		4096 points	1024 points
56 points			
Total 2048 points			Total 256 points
1024 points			256 points
8192 points		6144 points	1024 points
8192 points		4096 points	1024 points
56 points			
—			
—			
256 points			
—			
256 points			
—			
—			
7 points (Z,Z1 to Z6)			1 point (Z)
7 points (V,V1 to V6)			1 point (V)
8192 points/block (R0 to R8191)			
2 points			
8 points			
256 points			
32 points			
—			
—			
K-2147483648 to K2147483647			
H0 to HFFFFFFFF			
—			
—			

7.3.2 I/O Control method

I/O control method		QnACPU Q2AS(H)CPU-S1	AnUCPU A2USHCPU-S1	AnACPU	AnNCPU
Refresh mode		○	○	○	○[*2]
Direct I/O method	Partial refresh instruction	○	○	○	○
	Dedicated instruction[*1]	—	○	○	—
	Direct access input	○	—	—	—
	Direct access output	○	—	—	—
Direct mode		—	—	—	○[*2]

*1 The direct output dedicated instructions include the DOUT, DSET and SRST instruction and do not include the direct input dedicated instructions.

*2 The DIP switch on the AnNCPU enables to switch between the refresh mode and direct mode.

7.3.3 Usable data format for instructions

Setting data		QnACPU Q2AS(H)CPU-S1	AnUCPU A2USHCPU-S1	AnACPU	AnNCPU
Bit data	Bit device	○	○	○	○
	Word device	○ (Bit designation required)	—	—	—
Word data	Bit device	○ (Digit designation required)	○ (Digit designation required)	○ (Digit designation required)	○ (Digit designation required)
	Word device	○	○	○	○
Double-word data	Bit device	○ (Digit designation required)	○ (Digit designation required)	○ (Digit designation required)	○ (Digit designation required)
	Word device	○	○	○	○
Real number data		○	○	○	△
Character string data		○	○	—	—

7.3.4 Precautions for file register replacement

This section describes precautions for replacing the large-sized A/QnA series CPU using file registers with the small-sized AnS/Q2AS CPU .

(1) Precautions for replacing the large-sized A series CPU with the small-sized AnS series CPU

Item	Large-sized A series CPU	Small-sized AnS series CPU
Storage destination	Memory cassette	Built-in RAM
Maximum number of points	Depends on the memory cassette used	Depends on the built-in RAM capacity for each CPU
Number of points for 1 block	8k points	

The storage destination is different, however, the capacity setting of the parameter can be converted.
Since the file register area may not be secured when the built-in RAM capacity of CPU type is lower than the memory capacity before converted, calculate the memory capacity in advance.
The built-in RAM capacity of the A2USHCPU-S1 is 256k bytes (equivalent to the memory cassette, the A3NMCA-32).

(2) Precautions for replacing the large-sized QnA series CPU with the small-sized Q2AS series CPU

Item	Large-sized QnA series CPU	Small-sized Q2AS series CPU
Storage destination	Memory card (Up to 2 cards, 4 drives)	Memory card (1 card, 2 drives)
Maximum number of points	1018k points × 2 (When using two 2M memory cards)	1018k points (When using a 2M memory card)
Number of points for 1 block	32k points	

(a) Changing storage destination

The applicable memory card is reduced from 2 to 1, however, the file register setting of the parameter can be converted.
When "Memory card B" (second card) is used in the large-sized QnA series CPU, the parameter storage destination must be changed.

(b) Maximum number of points

When two memory cards are installed and used with switching files, the maximum number of points may not be secured when replacing with the small-sized Q2AS series CPU.

⊠POINT

Check the storage destination for the following items to be set in "PLC file" of the PLC parameter.
- Comment file used in a command
- Initial device value
- File for local device 0

7.3.5 Writing programs to ROM

(1) Precautions for replacing the large-sized A series CPU with the small-sized AnS series CPU

EP-ROM used in the large-sized A series CPU cannot be reused for the A2USHCPU-S1.
The E^2PROM memory cassette is included in the small-sized AnS series CPU.
This memory cassette is installed to the CPU, and the write of the parameter and main program can be made using the same operation with that of RAM by the GX Developer.
Consider replacing EP-ROM on the large-sized A series CPU with E^2PROM.

(2) Precautions for replacing the large-sized QnA series CPU with the small-sized Q2AS series CPU

The applicable memory card is reduced from 2 to 1, however, the boot file of the parameter can be converted.
When "Memory card B" (second card) is used in the large-sized QnA series CPU, the parameter storage destination must be changed.

8 COMMUNICATION AND INFORMATION MODULE REPLACEMENT

8.1 List of Alternative Communication and Information Module Models

Large-sized A/QnA series models to be discontinued		Alternative AnS/Q2AS series models	
Product	Model	Model	Remarks (restrictions)
Intelligent communication module	AD51H-S3	A1SD51S	1) Change in number of tasks: 8 → 2 2) Memory: 300k bytes → 60k bytes 3) Parallel: Yes → None 4) RS-232 connector: 25 pins → 9 pins 5) Change in number of modules: 2 → 1 (1 slot vacant) 6) Memory card I/F: 2 → None (file creation disabled) 7) No LED indicators 8) Program storage media: Memory card, EP-ROM → Built-in E^{2}PROM
	AD51-S3	A1SD51S	1) The BASIC program of AD51-S3 is incompatible with that of A1SD51S. Analyze the existing program to create a program with AD51H-BASIC.
Computer link module	AJ71UC24	A1SJ71UC24-R2 A1SJ71UC24-R4 A1SJ71UC24-PRF	1) When 2ch are used for RS-232 and RS-422, two modules are required. 2) AnS series do not have an interlock function between RS-232 and RS-422. 3) RS-232 connector: 25 pins → 9 pins

Multidrop link module	AJ71C22-S1	A1SJ71UC24-R4	The following functions differ.
			1) Buffer memory
			   Work area 61h to 07FFh → 71h to 0DFFh
			2) LED
			   With slave station I/O monitor display LED → None
			3) Setting switch
			   Baud rate setting: Fixed to 38400bps → 19200/38400 setting allowed
			   Master/local: Fixed to master → Setting allowed
			4) Terminal block screw
			   M4 screw → M3.5
			5) Terminating resistor
			   Built in → External

Ethernet module	AJ71E71N-B2	A1SJ71E71N-B2	No special restrictions
	AJ71E71N-B5	A1SJ71E71N-B5	No special restrictions
	AJ71E71N-T	A1SJ71E71N3-T	No special restrictions
	AJ71E71N3-T	A1SJ71E71N3-T	No special restrictions
	AJ71QE71N-B2	A1SJ71QE71N-B2	No special restrictions
	AJ71QE71N-B5	A1SJ71QE71N-B5	No special restrictions
	AJ71QE71N-T	A1SJ71QE71N3-T	No special restrictions
	AJ71QE71N3-T	A1SJ71QE71N3-T	No special restrictions
Host controller high-speed link module	AJ71C23-S3	None	No alternative

8.2 Communication/Information Modules Comparison

8.2.1 Intelligent communication modules comparison

(1) Comparisons between the AD51H-S3 and A1SD51S

(a) Performance specifications comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Specification		AD51H-S3	A1SD51S	Compati-bility	Precautions for replacement
Programming language		AD51H-BASIC		○	
Number of tasks		(Max.) 8 tasks	(Max.) 2 tasks	×	Review the BASIC program, and reduce the number of tasks to two or less.
Task start condition		• Start at power on. • Start by interrupt from the PLC CPU (Impossible when compiled BASIC is run.) • Start by start request from another task.		○	
Internal memory		Program memory: Max. 384k bytes/8 tasks (16/32/48/64k bytes selectable for one task.)	Program memory: Max. 64k bytes/2 tasks (16/32/48/64k bytes selectable for one task.)	×	Review the BASIC program, and reduce the memory size to 64k bytes or less.
		Common memory: 8k bytes		○	
		Extension register: 1024 points (2k bytes)		○	
		Extension relay: 1024 points		○	
General-purpose I/O		Input: 27 points Output: 23 points		○	
Buffer memory		3k words (6k bytes)		○	
Built-in interface	RS422I/F	RS-422 compliant, Channel 3, Connector connection, Transmission distance: Within 500m		○	
	RS232I/F	RS-232C compliant, Channel 1,2, Connector connection, Transmission distance: Within 15m		△	Use a suitable connector on the other side.
		D sub 25-pin (female), screw type	D sub 9-pin (female), screw type		
	Centronics I/F	Centronics compliant, Channel 4, Connector connection, Transmission distance: Within 3m	—	×	Change the external devices to the I/F devices of RS-232C/RS-422.
	Memory card I/F	Applicable memory card: A6MEM-□AW	—	×	Use the device memory of the CPU module.
Power failure protection		None (The data stored in a memory card can be protected by battery)	Protected (Common memory, extension relay, extension register)	—	
Storage to ROM		Possible (For execution program only)	Not allowed (although E^{2}PROM is built in the module.)	△	Write user program to ROM with the MSAVE command.
Console		• A7PHP • A7HGP • A7LMS • IBM-PC/AT-compatible PC • VG-620·····Manufactured by Victor Data Systems • VT-382·····Manufactured by Digital Equipment Corporation Japan		○	
Number of occupied I/O points		48 points (I/O assignment: 16 empty points + 32 special-purpose points)	32 points (I/O assignment: 32 special-purpose points)	△	Change the start I/O No. by PLC parameter.
Internal current consumption (5VDC)		1.0A	0.4A	○	
External dimensions		250(H) × 76(W) × 120(D) mm	130(H) × 34(W) × 93.6(D) mm	△	The dimensions are different.
Weight		0.9kg	0.3kg	○	

(b) Function comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Function		AD51H-S3	A1SD51S	Compati-bility	Precautions for replacement
BASIC program functions	Sub CPU function	Uses a BASIC program to perform complex numerical and function calculations that lengthen the scan time of a PLC CPU. • Collection, analysis and compensation of measurement data • Functional operations such as sines, logarithms, and square roots		○	
	Monitor display function	Displays the operating states (production status, operating status, and error information) on a console or terminal connected to the module.		○	
	Key operation function	Allows entry of production schedules, the production quantity, operations, and setting data from the keyboard of a console or terminal connected to the module.		○	
	Printer function	Prints the production plans, achievements, daily reports, error details, plan data, inspection results, and test results from a printer connected to the module.		○	
	Data input function	Allows data entry from a bar code reader or magnetic card reader connected to the module. (By using a BASIC program, the module can transmit and receive data in a free data format independently of the protocol of the communicating device.) • Inputs a production lot number, product name, quantity, etc. • Collects measurement values and test data		○	
	External device connection function	Transmits and receives data from/to a BASIC program by connecting a computer to the RS-232C or RS-422 interface.		○	
	File manage-ment function	Reads/writes data from/to a memory card installed in a memory card interface of the AD51H.	—	×	CPU module devices must be used as substitutes.
	Clock function	Reads and writes clock data (year, month, day, hour, minute, second and day of the week) from/to a PLC CPU which has a clock function.		○	
Offline programming function		Creates, corrects, and stores a BASIC program to a user's FD and prints it out independently by A7PHP/A7HGP/A7LMS/IBM-PC/AT-compatible PC.		○	
Online programming function		Creates, executes, and corrects a BASIC program by using system commands when a console is connected to the module. Stores/reads an execution program to/from E^{2}PROM using system commands.		○	
Multitask debugging function		Debugs a BASIC program while executing it by connecting a console and a debugger.		○	

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

○ : Compatible, △ : Partial change required, × : Incompatible

Input signal	AD51H-S3 Signal name	A1SD51S Signal name	Compatibility	Precautions for replacement
X0	Unusable	General-purpose input	△	
X1			△	
X2			△	
X3			△	
X4			△	
X5			△	
X6			△	
X7			△	
X8			△	
X9			△	
XA			△	
XB		Start of multitasking	△	
XC		Stop of multitasking	△	
XD		A1SD51S system down	△	
XE		Unusable	△	
XF			△	
X10	General-purpose input	General-purpose input	△	Change "X10 to X2F" to "X0 to X1F".
X11			△	
X12			△	
X13			△	
X14			△	
X15			△	
X16			△	
X17			△	
X18			△	
X19			△	
X1A			△	
X1B	Start of multitasking		△	
X1C	Stop of multitasking		△	
X1D	AD51H-S3 system down		△	
X1E	Unusable		△	
X1F			△	
X20 to X2F	General-purpose input	Outside I/O point range	△	

○ : Compatible, △ : Partial change required, × : Incompatible

Output signal	AD51H-S3 Signal name	A1SD51S Signal name	Compatibility	Precautions for replacement
Y0			△	
Y1			△	
Y2			△	
Y3			△	
Y4			△	
Y5			△	
Y6			△	
Y7			△	
Y8	Unusable	General-purpose output	△	
Y9			△	
YA			△	
YB			△	
YC			△	
YD			△	
YE			△	
YF			△	
Y10			△	
Y11		Designation of a general-purpose output/start BASIC task No. 1	△	
Y12		Designation of a general-purpose output/start BASIC task No. 2	△	
Y13			△	
Y14			△	
Y15		General-purpose output	△	
Y16			△	
Y17			△	Change "Y10 to Y2F" to "Y0 to Y1F".
Y18	General-purpose output		△	
Y19		Program start signal (unusable for a general-purpose output)	△	
Y1A			△	
Y1B			△	
Y1C		Unusable	△	
Y1D			△	
Y1E			△	
Y1F			△	
Y20			△	
Y21	Designation of a general-purpose output/start BASIC task No. 1		△	
Y22	Designation of a general-purpose output/start BASIC task No. 2		△	
Y23	Designation of a general-purpose output/start BASIC task No. 3		△	
Y24	Designation of a general-purpose output/start BASIC task No. 4		△	
Y25	Designation of a general-purpose output/start BASIC task No. 5		△	
Y26	Designation of a general-purpose output/start BASIC task No. 6	Outside I/O point range	△	
Y27	Designation of a general-purpose output/start BASIC task No. 7		△	
Y28	Designation of a general-purpose output/start BASIC task No. 8		△	
Y29	Program start signal (unusable for a general-purpose output)		△	
Y2A to Y2F	General-purpose output		△	

(d) Buffer memory address comparison
No special differences are identified.

(2) Comparisons between the AD51-S3 and A1SD51S

The BASIC program of AD51-S3 is incompatible with that of A1SD51S. Analyze the existing program to create a program with AD51H-BASIC.

(a) Performance specifications comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Specification		AD51-S3	A1SD51S	Compati-bility	Precautions for replacement
Programming language		GPC-BASIC	AD51H-BASIC	×	Change the BASIC program to AD51H-BASIC.
Number of tasks		(Max.) 8 tasks	(Max.) 2 tasks	×	Review the BASIC program, and reduce the number of tasks to two or less.
Task start condition		• Start at power on. • Start by interrupt from the PLC CPU (Impossible when compiled BASIC is run). • Start by real time interrupt.	• Start at power on. • Start by interrupt from the PLC CPU (Impossible when compiled BASIC is run). • Start by start request from another task.	△	When using a real time interrupt, the program must be changed.
Internal memory		Program memory: Max. 64k bytes+48k bytes (Writing programs to ROM)	Program memory: Max. 64k bytes/2 tasks	×	Review the BASIC program, and reduce the memory size to 64k bytes or less.
		Common memory: 2k bytes	Common memory: 8k bytes	○	
		—	Extension register: 1024 points (2k bytes)	—	
		—	Extension relay: 1024 points	—	
General-purpose I/O		Input: 13 points Output: 10 points	Input: 27 points Output: 23 points	△	Change the start I/O No. in the PLC parameter I/O assignment setting.
Buffer memory		3k words (6k bytes)		○	
Built-in interface	RS422I/F	RS-422 compliant, Connector connection, Transmission distance: Within 500m		△	Change into one channel when using two channels.Also, change the channel number.
		Channel 1, 2 D sub 25-pin (female), screw type	Channel 3 D sub 25-pin (female), screw type		
	RS232I/F	RS-232C compliant, Connector connection, Transmission distance: Within 15m		△	Also, change the channel number and the number of connector pins.
		Channel 3, 4 D sub 25-pin (female), screw type	Channel 1, 2 D sub 9-pin (female), screw type		
Power failure protection		None	Protected (Common memory, extension relay, extension register)	○	
Storage to ROM		Possible (8k ROM/16k ROM)	Not allowed (although E^{2}PROM is built in the module.)	△	Write user program to ROM with the MSAVE command.
Console		• A6GPP • A6PHP • VG-620/670··· Manufactured by Victor Data Systems	• A7PHP • A7HGP • A7LMS • IBM-PC/AT-compatible PC • VG-620···· Manufactured by Victor Data Systems • VT-382···· Manufactured by Digital Equipment Corporation Japan	△	Use compatible consoles.
Number of occupied I/O points		48 points (I/O assignment: 16 empty points + 32 special-purpose points)	32 points (I/O assignment: 32 special-purpose points)	△	Change the start I/O No. in the PLC parameter I/O assignment setting.
Internal power consumption (5VDC)		1.3A	0.4A	○	
External dimensions		250(H) × 76(W) × 120(D) mm	130(H) × 34(W) × 93.6(D) mm	△	The dimensions are different.
Weight		1.1kg	0.3kg	○	

(b) Function comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Function		AD51-S3	A1SD51S	Compati-bility	Precautions for replacement
BASIC program functions	Sub CPU function	Uses a BASIC program to perform complex numeric and function calculations which may result in a prolonged PLC CPU scan time. • Collection, analysis and correction of measurement data • Functional operations such as sines, logarithms and square roots		○	The BASIC program of AD51-S3 is incompatible with that of A1SD51S. Analyze the existing program to create a program with AD51H-BASIC.
	Monitor display function	Displays working states (progress of production, operation status, error, etc.) on the console or terminal connected to the module.		○	
	Key operation function	Allows entry of production schedules, production output, operation and setting data from the keyboard of a console or terminal.		○	
	Printer function	Prints production plans, production records, daily reports, errors, plan data, inspection results, test records, etc. from a printer connected to the module.		○	
	Data input function	Allows data entry through a bar code reader or magnetic card reader connected to the module. (Since a BASIC program enables the module to transmit and receive data in a free format, it can perform data communications in the protocol the communicating device uses.) • Input of production lot numbers, production names, quantities, etc. • Collection of measurement values and test data		○	
	External device connection function	Establishes data communications by using a BASIC program and connecting a computer to the RS-232C or RS-422/485 interface of the module.		○	
	Clock function	Reads and writes clock data (year, month, day, hour, minute, second and day of the week) from/to a PLC CPU which has a clock function.		○	
Offline programming function		—	Allows the A7PHP/A7HGP/A7LMS/ IBM-PC/AT-compatible PC to create, correct and store BASIC programs on a user's FD and to print them independently.	—	
Online programming function		Creates, executes and corrects BASIC programs on a console connected to the module using system commands. Stores and reads execution programs to/from an E^{2}PROM with system commands.		○	
Multitask debugging function		—	Debugs a BASIC program on a console and a debugger connected to the module while executing it by multitasking.	—	

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

○ : Compatible, △ : Partial change required, × : Incompatible

Input signal	AD51-S3 Signal name	A1SD51S Signal name	Compati-bility	Precautions for replacement
X0	Unusable	General-purpose input	△	
X1			△	
X2			△	
X3			△	
X4			△	
X5			△	
X6			△	
X7			△	
X8			△	
X9			△	
XA			△	
XB		Start of multitasking	△	
XC		Stop of multitasking	△	
XD		A1SD51S system down	△	
XE		Unusable	△	
XF			△	
X10	General-purpose input	General-purpose input	△	Change "X10 to X1C" to "X0 to XA" and "X10 to X1F". Also, change "X1D" to "XD".
X11			△	
X12			△	
X13			△	
X14			△	
X15			△	
X16			△	
X17			△	
X18			△	
X19			△	
X1A			△	
X1B			△	
X1C			△	
X1D	AD51-S3 system down		△	
X1E	Unusable		△	
X1F			△	
X20 to X2F	Unusable	Outside I/O point range	△	

○ : Compatible, △ : Partial change required, × : Incompatible

Output signal	AD51-S3 Signal name	A1SD51S Signal name	Compati-bility	Precautions for replacement
Y0		General-purpose output	△	
Y1			△	
Y2			△	
Y3			△	
Y4			△	
Y5			△	
Y6			△	
Y7			△	
Y8			△	
Y9			△	
YA			△	
YB			△	
YC			△	
YD			△	
YE			△	
YF			△	
Y10	Unused (May be used for internal relay (M).)		△	
Y11		Designation of a general-purpose output/start BASIC task No. 1	△	
Y12		Designation of a general-purpose output/start BASIC task No. 2	△	
Y13		General-purpose output	△	
Y14			△	
Y15			△	
Y16			△	Change "Y20 to Y29" to "Y0 to Y1F". However, when Y29 is used as an interrupt signal, the program must be reviewed.
Y17			△	
Y18			△	
Y19			△	
Y1A			△	
Y1B			△	
Y1C			△	
Y1D			△	
Y1E			△	
Y1F			△	
Y20	General-purpose output	Outside I/O point range	△	
Y21			△	
Y22			△	
Y23			△	
Y24			△	
Y25			△	
Y26			△	
Y27			△	
Y28			△	
Y29	When this turns on in the sequence program, an interrupt is triggered in the AD51.		△	
Y2A	Unusable		△	
Y2B			△	
Y2C			△	
Y2D			△	
Y2E			△	
Y2F			△	

(d) Buffer memory address comparison
No special differences are identified.

8.2.2 Serial communication modules comparison

(1) Comparisons between the AJ71UC24 and A1SJ71UC24-R2/R4/PRF

(a) Performance specifications comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Specification		AJ71UC24	A1SJ71UC24-R2/R4/PRF	Compati-bility	Precautions for replacement
Interface*		RS-232 compliant (D-Sub 25P)	RS-232 compliant (D-Sub 9P)	△	The connector on the connection cable must be changed. Use A1SJ71UC24-□□ when using two channels or more.
		RS-422/485 compliant	RS-422/485 compliant	△	
Communication method	Communication using dedicated protocol	Half-duplex communication		○	
	Non-procedural/bidirectional communication	Full duplex communication (1:1 connection) /Half-duplex communication (1:n, m:n connection)		○	
Synchronization method		Start stop synchronization (asynchronous method)		○	
Transmission speed		300 to 19200 bps		○	
Data format	Start bit	1		○	
	Data bit	7 or 8		○	
	Parity bit	1 (vertical parity)/none		○	
	Stop bit	1 or 2		○	
Access cycle	Communication using dedicated protocol	One request is processed when the mounted PLC CPU executes END processing.		○	
	Non-procedural/bidirectional communication	Transmission is executed at each send request, and reception is available at all times.		○	
Error detection	Parity check	Performed (odd/even)/none		○	
	Sum check	Performed (Dedicated protocol/Bidirectional)/none		○	
Transmission control		RS-232 / RS-422/485 table below		○	
Line configuration (connection)	RS-232	1:1		○	
	RS-422/485	1:1, 1:n, m:n (n: max.32, m+n: max.32)		○	
Line configuration (data communication)	Communication using dedicated protocol	1:1, 1:n, m:n (n: max.32, m+n: max.32)		○	For details on linked operation between interfaces, refer to the manual.
	Non-procedural communication	1:1, 1:n (n: max.32)		○	
	Bidirectional communication	1:1		○	
Transmission distance	RS-232	Max. 15m		○	
	RS-422/485	Max. 500m (overall distance)		○	
Current consumption		0.3A	0.1A	○	
No. of E²PROM writes No. of flash ROM writes		Max. 100,000 times on same area in E²PROM		○	
Number of occupied I/O points		32 points (I/O assignment: special 32 points)		○	
External dimensions		250(H) × 37.5(W) × 131(D) mm	130(H) × 34.5(W) × 93.6(D) mm	△	The dimensions are different.
Weight		0.63kg	0.22kg (A1SJ71UC24-R2) 0.25kg (A1SJ71UC24-R4) 0.22kg (A1SJ71UC24-PRF)	○	

Transmission control detail:

	RS-232	RS-422/485
DTR/DSR (ER/DR) control	Available	N/A
CD signal control	Available	N/A
DC1/DC3 (Xon/Xoff) control DC2/DC4 control	Available	Available

*The following table shows the AJ71UC24, A1SJ71UC24-R2, A1SJ71UC24-R4, A1SJ71UC24-PRF interface configurations.

Model	RS-232	RS-422/485
AJ71UC24	1ch	1ch
A1SJ71UC24-R2	1ch	—
A1SJ71UC24-R4	—	1ch
A1SJ71UC24-PRF	1ch	—

(b) Function comparison

○ : Compatible, △ : Partial change required, × : Incompatible

	Function	AJ71UC24	A1SJ71UC24-R2/R4/PRF	Compati-bility	Precautions for replacement
Communication using dedicated protocol	Device memory read/write	PLC CPU data are read from and written to the external device.		○	
	On-demand	Data are transmitted to the external device from the PLC CPU.		○	
Non-procedural communication	Data transmission PLC → external device	Data are transmitted to the external device from the PLC CPU.		○	
	Data reception PLC ← external device	The PLC recieves data transmitted from the external device.		○	
Bidirectional communication	Data transmission PLC → external device	Data are transmitted to the external device from the PLC CPU.		○	
	Data reception PLC ← external device	The PLC recieves data transmitted from the external device.		○	
Transmission using printer function		Transmits messages (character strings) to the printer from the PLC CPU.		○	
Transmission control	DTR/DSR control	Data exchange with the external device is controlled by RS-232 control signals.		○	
	CD signal control			○	
	DC code control	DC codes (including Xon/Xoff) are sent/received to control data exchange with the external device.		○	
Multidrop connection with RS-232C and RS-422 mixed		Multidrop connection with RS-232C and RS-422 mixed is available.	Multidrop connection with RS-232C and RS-422 mixed is not available.	×	For the wiring method, refer to the manual.

(c) Switch settings comparisons

1) Mode setting switch

The difference between the AJ71UC24 and A1SJ71UC24-R2/R4/PRF is as follows.

Mode setting switch number	RS-232C side setting	RS-422 side setting	AJ71UC24	A1SJ71UC24-R2/ PRF	A1SJ71UC24-R4
0	Use prohibited		—	—	—
1 to 3	Type n protocol	Nonprocedural mode	○	○	—
4	Type 4 protocol	Nonprocedural mode	○	○	○
5	Nonprocedural mode	Type 1 protocol	○	○	○
6 to 8	Nonprocedural mode	Type n protocol	○	—	○
9	Nonprocedural mode		○	—	—
A to D	Type n protocol		○	—	—
E	Use prohibited		—	—	—
F	Self-loopback test		○	○	○

2) Transmission setting switch

AJ71UC24

Switch setting	Setting switch	Setting item		Setting switch status								Remarks
				OFF				ON				
	SW11	Main channel setting		RS-232C				RS-422/485				Valid when mode setting switches 9 to D are set.
	SW12	Data bit setting		7 bits				8 bits				Excluding parity bit
		Transmission speed (BPS)	300	600	1200	2400	4800	9600	19200	Use prohibited	
SW11	SW13		OFF	ON	OFF	ON	OFF	ON	OFF	ON	—
SW12	SW14	Transmission speed setting	OFF	OFF	ON	ON	OFF	OFF	ON	ON	
SW13 SW14	SW15		OFF	OFF	OFF	OFF	ON	ON	ON	ON	
SW15 SW16	SW16	Parity bit setting		None				Yes			—
SW17 SW18	SW17	Even/odd parity setting		Odd				Even			Valid when parity bit is used.
SW21	SW18	Stop bit setting		1 bit				2 bits			—
SW22	SW21	Sum check		None				Yes			For dedicated protocol
SW23 SW24	SW22	Write during RUN		Disabled				Enabled			
	SW23	Computer link/ multidrop link selection		Multidrop link				Computer link			Always set to computer link (ON).
	SW24	Master station/local station setting		Multidrop link local station				Multidrop link master station			Setting ignored for computer link.

A1SJ71UC24-R2/PRF

Switch setting	Setting switch	Setting item		Setting switch status								Remarks
				ON				OFF				
	SW03	Unused		—				—				—
	SW04	Write during RUN		Enabled				Disabled				For dedicated protocol
		Transmission speed (BPS)	300	600	1200	2400	4800	9600	19200	Use prohibited	
SW03	SW05		OFF	ON	OFF	ON	OFF	ON	OFF	ON	—
SW04	SW06	Transmission speed setting	OFF	OFF	ON	ON	OFF	OFF	ON	ON	
SW05 SW06	SW07		OFF	OFF	OFF	OFF	ON	ON	ON	ON	
SW07 SW08	SW08	Data bit setting		8 bits				7 bits			Excluding parity bit
SW09 SW10	SW09	Parity bit setting		Yes				None			—
SW11 SW12	SW10	Even/odd parity setting		Even				Odd			Valid when parity bit is used.
	SW11	Stop bit setting		2 bits				1 bit			—
	SW12	Sum check		Yes				None			For dedicated protocol

A1SJ71UC24-R4

Switch setting	Setting switch	Setting item		Setting switch status								Remarks
				ON				OFF				
	SW01	Master station/local station setting		Multidrop link master station				Multidrop link local station				Setting ignored for computer link.
	SW02	Computer link/multidrop link selection		Computer link				Multidrop link				Always set to computer link (ON).
	SW03	Unused		—				—				—
	SW04	Write during RUN		Enabled				Disabled				For dedicated protocol
		Transmission speed (BPS)		300	600	1200	2400	4800	9600	19200	Use prohibited	
	SW05	Transmission speed setting		OFF	ON	OFF	ON	OFF	ON	OFF	ON	—
	SW06			OFF	OFF	ON	ON	OFF	OFF	ON	ON	
	SW07			OFF	OFF	OFF	OFF	ON	ON	ON	ON	
	SW08	Data bit setting		8 bits				7 bits				Excluding parity bit
	SW09	Parity bit setting		Yes				None				—
	SW10	Even/odd parity setting		Even				Odd				Valid when parity bit is used.
	SW11	Stop bit setting		2 bits				1 bit				—
	SW12	Sum check		Yes				None				For dedicated protocol

3) Station number setting switch

The difference between the AJ71UC24 and A1SJ71UC24-R2/R4/PRF is as follows.

Item	AJ71UC24	A1SJ71UC24-R2/R4/PRF	Compati-bility	Precautions for replacement
Station number setting switch	Equipped with station number setting switch	No station number setting switch	×	Specify 00_H for the station number to access a computer with a dedicated protocol from an external device.

(d) Comparison of I/O signals for PLC CPU

There are no differences in I/O signals between the AJ71UC24 and A1SJ71UC24-R2/R4/PRF.

○ : Compatible, △ : Partial change required, × : Incompatible

Input signal	AJ71UC24 Signal name	A1SJ71UC24-R2/R4/PRF Signal name	Compati-bility	Precautions for replacement
X0	Transmission complete		○	
X1	Receive data read request		○	
X2	Global signal		○	
X3	On-demand in execution		○	
X4	Computer link module transmission sequence status		○	
X5			○	
X6			○	
X7	Computer link module ready		○	
X8	Use prohibited		○	
X9	Mode switching complete		○	
XA	Use prohibited		○	
XB			○	
XC			○	
XD	WDT error		○	
XE	Use prohibited		○	
XF			○	
X10			○	
X11			○	
X12			○	
X13			○	
X14			○	
X15			○	
X16			○	
X17			○	
X18			○	
X19			○	
X1A			○	
X1B			○	
X1C			○	
X1D			○	
X1E			○	
X1F			○	

○ : Compatible, △ : Partial change required, × : Incompatible

Output signal	AJ71UC24	A1SJ71UC24-R2/R4/PRF	Compati-bility	Precautions for replacement
	Signal name	Signal name		
Y0			○	
Y1			○	
Y2			○	
Y3			○	
Y4			○	
Y5			○	
Y6			○	
Y7	Use prohibited		○	
Y8			○	
Y9			○	
YA			○	
YB			○	
YC			○	
YD			○	
YE			○	
YF			○	
Y10	Send request		○	
Y11	Receive data read complete		○	
Y12			○	
Y13			○	
Y14			○	
Y15	Use prohibited		○	
Y16			○	
Y17			○	
Y18			○	
Y19	Mode switching request		○	
Y1A			○	
Y1B			○	
Y1C	Use prohibited		○	
Y1D			○	
Y1E			○	
Y1F			○	

(e) Buffer memory address comparison

No special differences are identified in buffer memory assignment.

○ : Compatible, △ : Partial change required, × : Incompatible

Address		AJ71UC24	A1SJ71UC24-R2/R4/PRF	Compati-bility	Precautions for replacement
HEX	DEC	Buffer memory name	Buffer memory name		
0H	0	Non-procedural send data count storage area		○	
1H to 7FH	1 to 127	Send data storage area		○	
80H	128	Non-procedural receive data count storage area		○	
81H to FFH	129 to 255	Receive data storage area		○	
100H	256	Non-procedural receive end code specification area		○	
to	to	to		—	
103H	259	Non-procedural word/byte specification area		○	
104H	260	Non-procedural send buffer memory head address specification area		○	
105H	261	Non-procedural send buffer memory length specification area		○	
106H	262	Non-procedural receive buffer memory head address specification area		○	
107H	263	Non-procedural receive buffer memory length specification area		○	
108H	264	Non-procedural receive end data count specification area		○	
109H	265	On-demand buffer memory head address specification area		○	
10AH	266	On-demand data length specification area		○	
10BH	267	RS-232 CD terminal check setting area		○	
to	to	to		—	
DFFH	3583	—		○	

(2) Comparisons between AJ71C22-S1 and A1SJ71UC24-R4

(a) Performance specifications comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Specification		AJ71C22-S1	A1SJ71UC24-R4	Compatibility	Precautions for replacement
Interfaces		RS-422 compliant	RS-422/485 compliant	○	
Communication method		Half-duplex communication		○	
Synchronization method		Start stop synchronization (asynchronous method)		○	
Transmission speed		38400bps	19200, 38400bps	○	
Data format	Start bit	1		○	
	Data bit	7		○	
	Parity bit	1 (vertical parity)		○	
	Stop bit	1		○	
Error detection		Parity check (Even)		○	
		BCC check		○	
Line configuration (connection)		8 local stations for 1 master station		○	
Transmission distance		Max. 500m (overall distance)		○	
Current consumption		1.4A	0.1A	○	
Number of occupied I/O points		32 points (I/O assignment: 32 special-purpose points)		○	
External dimensions		250(H) × 37.5(W) × 120(D) mm	130(H) × 34.5(W) × 93.6(D) mm	△	The dimensions are different.
Weight		0.6kg	0.25kg	○	

(b) Function comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Function	AJ71C22-S1	A1SJ71UC24-R4	Compati-bility	Precautions for replacement
Data communication	1) ON/OFF data is sent to and received from a maximum of 8 slave stations via the RS-422 interface. 2) Maximum number of ON/OFF data transferred: Total of inputs/outputs for all slave stations ······ Outputs + Inputs $\leqq$ 512 points Inputs/outputs per station ······ Outputs $\leqq$ 128 points Inputs $\leqq$ 128 points 3) For communication with a slave station, the following may be specified for the network: (a) Slave stations to communicate with (b) Priority order of slave stations (c) Number of communication data points		○	
Communication data monitoring	Data communicated with a slave station can be monitored in units of 8 points.	—	×	A1SJ71UC24-R4 does not have the LED for slave station communication data monitoring. Directly monitor the buffer memory addresses 20H to 3FH and 40H to 5FH.
Self-loopback test	Communication check is conducted for the RS422 interface.		○	

(c) Comparison of I/O signals for PLC CPU

There are no differences in I/O signals between the AJ71C22-S1 and A1SJ71UC24-R4.

○ : Compatible, △ : Partial change required, × : Incompatible

Input signal	AJ71C22-S1 Signal name	A1SJ71UC24-R4 Signal name	Compati-bility	Precautions for replacement
X0	Data transmission sequence in execution		○	
X1	Pre-transmission sequence error		○	
X2	Data transmission sequence error		○	
X3	Use prohibited		○	
X4			○	
X5			○	
X6			○	
X7			○	
X8			○	
X9			○	
XA			○	
XB			○	
XC			○	
XD	WDT error		○	
XE	Use prohibited		○	
XF			○	

○ : Compatible, △ : Partial change required, × : Incompatible

Output signal	AJ71C22-S1 Signal name	A1SJ71UC24-R4 Signal name	Compati-bility	Precautions for replacement
Y0	Link start		○	
Y1	Error reset		○	
Y2	Use prohibited		○	
Y3			○	
Y4			○	
Y5			○	
Y6			○	
Y7			○	
Y8			○	
Y9			○	
YA			○	
YB			○	
YC			○	
YD			○	
YE			○	
YF			○	

(d) Buffer memory address comparison

No special differences are identified in buffer memory assignment.

◯ : Compatible, △ : Partial change required, × : Incompatible

Address		AJ71C22-S1	A1SJ71UC24-R4	Compati-bility	Precautions for replacement
HEX	DEC	Buffer memory name	Buffer memory name		
0H	0	Number of access slave stations		◯	
1H to 8H	1 to 8	Transmission priority		◯	
9H to 10H	9 to 16	Number of bits received		◯	
11H to 18H	17 to 24	Number of bits received		◯	
19H to 1DH	25 to 29	Use prohibited	Use prohibited	◯	
1EH	30		Max. number of link points (256/512 points)	—	
1FH	31		Off-link station	—	
20H to 3FH	32 to 63	Receive data storing area		◯	
40H to 5FH	64 to 95	Send data storing area		◯	
60H	96	Error code		◯	
61H	97	Error slave station display		◯	
62H	98	Link time storing area (current value)		◯	
63H	99	Link time storing area (maximum value)		◯	
64H to 6FH	100 to 111	Use prohibited		◯	
70H	112	Error return request area		◯	
71H to 7FFH	113 to 2047	Work area	Work area	◯	
to DFFH	to 3583	—		—	

9 NETWORK SYSTEM REPLACEMENT

9.1 List of Alternative Network Module Models

Large-sized A/QnA series models to be discontinued		Alternative small-sized AnS/Q2AS series models	
Product name	**Model name**	**Model name**	**Remarks (restrictions)**
CPU module with link	A1NCPUP21	A2USHCPU-S1 A1SJ71AP21	Refer to Section 2.1 for the details.
	A1NCPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2NCPUP21	A2USHCPU-S1 A1SJ71AP21	
	A2NCPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2NCPUP21-S1	A2USHCPU-S1 A1SJ71AP21	
	A2NCPUR21-S1	A2USHCPU-S1 A1SJ71AR21	
	A3NCPUP21	A2USHCPU-S1 A1SJ71AP21	
	A3NCPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2ACPUP21	A2USHCPU-S1 A1SJ71AP21	
	A2ACPUR21	A2USHCPU-S1 A1SJ71AR21	
	A2ACPUP21-S1	A2USHCPU-S1 A1SJ71AP21	
	A2ACPUR21-S1	A2USHCPU-S1 A1SJ71AR21	
	A3ACPUP21	A2USHCPU-S1 A1SJ71AP21	
	A3ACPUR21	A2USHCPU-S1 A1SJ71AR21	
	A1NCPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	
	A2NCPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	
	A2NCPUP21-S4	A2USHCPU-S1 A1SJ71AP21-S3	
	A3NCPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	
	A2ACPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	
	A2ACPUP21-S4	A2USHCPU-S1 A1SJ71AP21-S3	
	A3ACPUP21-S3	A2USHCPU-S1 A1SJ71AP21-S3	
MELSECNET/MINI-S3 master module	AJ71PT32-S3	A1SJ71PT32-S3	No monitor station function
	AJ71T32-S3	A1SJ71PT32-S3	
MELSEC-I/OLINK master module	AJ51T64	A1SJ51T64	No special restrictions

Large-sized A/QnA series models to be discontinued		Alternative small-sized AnS/Q2AS series models	
Product name	Model name	Model name	Remarks (restrictions)
MELSECNET data link module	AJ71AP21	A1SJ71AP21	No special restrictions
	AJ71AR21	A1SJ71AR21	
MELSECNET/10 * data link module	AJ71LP21	A1SJ71LP21	No special restrictions
	AJ71LP21G	None	No alternative model
	AJ71LR21	A1SJ71LR21	No special restrictions
	AJ71BR11	A1SJ71BR11	
	AJ71QLP21	A1SJ71QLP21	
	AJ71QLP21S	A1SJ71QLP21S	
	AJ71QLP21G	None	No alternative model
	AJ71QLR21	A1SJ71QLR21	No special restrictions
	AJ71QBR11	A1SJ71QBR11	
B/NET interface module	AJ71B62-S3	A1SJ71B62-S3	No special restrictions
JEMANET(OPCN-1) interface module	AJ71J92-S3	A1SJ71J92-S3	No special restrictions
CC-Link master/local module	AJ61BT11	A1SJ61BT11	No special restrictions
	AJ61QBT11	A1SJ61QBT11	

* This is not a model to be discontinued.

9.2 Network Module Comparison

9.2.1 Replacement of CPU module with link

(1) Empty slot (32 occupied points) required

The small-sized A series include no CPU module with link function. For this reason, the existing CPU module with link function must be replaced with a CPU + a link module so that extra 1 slot (32 occupied points) is required.

When large-sized
A CPU (with link) is used
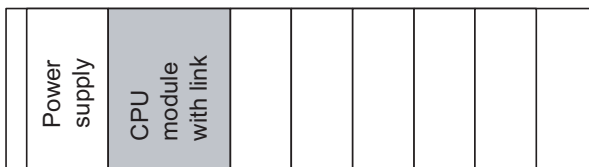
When replaced
with small-sized AnS CPU

(2) Network parameter settings are required

Network parameter settings are required. Refer to Section 7.2.

9.2.2 MELSECNET/MINI-S3 master module comparison

(1) Comparison between AJ71PT32-S3 (AJ71T32-S3) and A1SJ71PT32-S3 (A1SJ71T32-S3)

(a) Performance specifications comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Specification	AJ71PT32-S3 (AJ71T32-S3)	A1SJ71PT32-S3 (A1SJ71T32-S3)	Compati-bilty	Precautions for replacement
Max. number of link stations	64		○	
Input	512 points		○	
Output	512 points		○	
I/O refresh time	3.2 to 18ms		○	
Communication speed	1.5Mbps		○	
Optical transmission level (Optical cable)	-12.5 to -11.6dB		○	
Optical receive level (Optical cable)	-34.8 to -14.0dB		○	
Optical wave length (Optical cable)	660nm (Visible radiation)		○	
Max. inter-station transmission distance	50m (Optical cable)/100m (Twisted pair cable)		○	
Number of occupied I/O points	I/O mode: 32 Extension mode: 48		○	
Internal current consumption (5VDC)	0.35A		—	
External dimensions	250(H) × 37.5(W) × 119(D) mm	130(H) × 34.5(W) × 107.6(D) mm	△	The dimensions are different.
Weight	0.6kg		○	

(b) Function comparison

○ : Compatible, △ : Partial change required, × : Incompatible

Function	AJ71PT32-S3 (AJ71T32-S3)	A1SJ71PT32-S3 (A1SJ71T32-S3)	Compati-bility	Precautions for replacement
MINI standard protocol	Standard protocol of remote terminal module		○	
Nonprocedural protocol	Communication protocol for AJ35PTF-R2		○	
Dedicated protocol	Communication protocol for AJ35PTF-R2		○	
Tool box protocol	Communication protocol for AJ35PT-OPB-□ □		○	
E.C.MODE	Yes		○	
Monitor station setting	Equipped with monitor station No. setting switch	No monitor station No. setting switch	△	Monitor the buffer memory address 10 to 41/110 to 141 by GX Developer.

(c) Comparison of I/O signals for PLC CPUs
No special differences are identified.

(d) Buffer memory address comparison
No special differences are identified.

9.2.3 MELSEC-I/OLINK master module comparison

(1) Comparisons between AJ51T64 and A1SJ51T64

(a) Performance specifications comparison

○: Compatible, △: Partial change required, ×: Incompatible

Item		Specification		Comati-bility	Precautions for replacement
		AJ51T64	A1SJ51T64		
Max. number of control I/O points		128 points (if the same numbers are used for X and Y)		○	
I/O refresh time		Approx. 5.4ms (regardless of the number of points)		○	
Communication cable		0.75mm^2 or larger twisted pair cable 0.75mm^2 or larger cabtyre cable		○	
Communications specifications	Communication speed	38400bps		○	
	Communication method	Register insertion method		○	
	Synchronization method	Combination of frame synchronization and bit synchronization methods		○	
	Error control system	Parity check		○	
	Transmission channel	Bus (T-branch possible, terminal resistors unnecessary)		○	
	Transmission distance	Overall distance: 200m		○	
	Max. number of remote I/O modules	16 stations per master module		○	
Error (RUN) indication/output		Indication by LEDs The PLC CPU detects errors by "blown fuse". External output with RUN A/RUN B		○	
LED		Communication status and error station station No. display	Communication status display	△	Error station station No. is not displayed.
Setting switch		On module face	Inside module	△	Functions are the same. However, the position of the switches differs.
Number of occupied I/O points		64 points (I/O assignment: 64 output points)*		○	
External power supply voltage		21.6 to 27.6VDC (for the transmission channel)		○	
External power supply current consumption		90mA (TYP 24VDC)		○	
Internal current consumption (5VDC)		115mA		○	
External dimensions		250(H)×37.5(W)×119(D) mm	130(H)×34.5(W)×93.6(D) mm	△	The dimensions are different.
Weight		0.35kg	0.3kg	○	

* If only a few remote I/O modules are used, perform I/O assignment with a peripheral device to decrease the number of occupied I/O points to 16, 32, or 48.

(b) Comparison of I/O signals for PLC CPUs
No special differences are identified.

10 SPECIAL FUNCTION MODULE REPLACEMENT

10.1 List of Alternative Special Function Module Models

A series models to be discontinued		Alternative AnS series models	
Product	Model	Model	Remarks (restrictions)
Analog input module	A616AD	A1S68AD	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Required (2 modules necessary) 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change to 8CH/module and input signal (only positive current for I) 5) Function specifications: No multiplexer function
	A68AD	A1S68AD	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change in I/O characteristics 5) Function specifications: Change in A/D conversion enable/disable function settings
	A68AD-S2	A1S68AD	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change in I/O characteristics 5) Function specifications: Not required
	A68ADN	A1S68AD	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change in I/O characteristics and resolution 5) Function specifications: Not required
Multiplexer module	A60MX	None	Consider using multiple A1S68AD modules.
	A60MXRN	None	Consider using the A1S68AD and isolation signal converter.
	A60MXR	None	Consider using the A1S68AD and isolation signal converter.
	A60MXTN	None	Consider using multiple A1S68TD modules.
	A60MXT	None	Consider using multiple A1S68TD modules.

A series models to be discontinued		Alternative AnS series models	
Product	Model	Model	Remarks (restrictions)
Analog output module	A616DAI	A1S68DAI	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Required (2 modules necessary) 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change to 8CH/module and in input current range 5) Function specifications: Change in relationships between D/A conversion disable channel and conversion time
	A616DAV	A1S68DAV	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Required (2 modules necessary) 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change to 8CH/module and in resolution · accuracy 5) Function specifications: Change in relationships between D/A conversion disable channel and conversion time
	A62DA	A1S62DA	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change in I/O characteristics and conversion time 5) Function specifications: Not required
	A62DA-S1	A1S62DA	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change in I/O characteristics and conversion time 5) Function specifications: Not required
	A68DAI-S1	A1S68DAI	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change in output current range and I/O characteristics, increase of current consumption 5) Function specifications: Not required
	A68DAV	A1S68DAV	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change in output current range and I/O characteristics, increase of current consumption 5) Function specifications: Not required
Temperature input module	A616TD	A1S68TD	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Required (2 modules necessary) 3) Program changes: Change of I/O signals and buffer memory addresses 4) Performance specifications: Change to 8CH/module, and in input temperature range and conversion accuracy 5) Function specifications: Change in relationships between conversion disable channel and conversion time
	A68RD3N	A1S62RD3N	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Required (4 modules necessary) 3) Program changes: Changed 4) Performance specifications: Change to 2CH/module 5) Function specifications: Not required
	A68RD4N	A1S62RD4N	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Required (4 modules necessary) 3) Program changes: Changed 4) Performance specifications: Change to 2CH/module 5) Function specifications: Not required
High-speed counter module	AD61	A1SD62	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of buffer memory addresses 4) Performance specifications: Upward-compatibility 5) Function specifications: Upward-compatibility
	AD61S1	A1SD62	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Not required 3) Program changes: Change of buffer memory addresses 4) Performance specifications: Upward-compatibility 5) Function specifications: Upward-compatibility
Position detection module	A62LS-S5	A1S62LS	1) External wiring change: Require of terminal block to connector 2) Change in number of modules: Required (2 modules → 1 module) 3) Program changes: Not changed. Note that the data setting must be made from a sequence program or the data setting module "VS-T62" manufactured by NSD corporation. 4) Performance specifications: Not required 5) Function specifications: Not required
	A61LS	None	No alternative model
	A63LS	None	

A series models to be discontinued		Alternative AnS series models	
Product	Model	Model	Remarks (restrictions)
Positioning module	AD70	A1SD70	1) External wiring change: Required to use a different terminal block 2) Change in number of modules: Required (1 module → 2 modules) 3) Program changes: Not changed 4) Performance specifications: Not required 5) Function specifications: Not required
	AD72	None	No alternative model
	AD75M1	A1SD75M1	No special restrictions However, since the connector for peripheral connection is different, A1SD75-C01HA cable is required.
	AD75M2	A1SD75M2	No special restrictions However, since the connector for peripheral connection is different, A1SD75-C01HA cable is required.
	AD75M3	A1SD75M3	No special restrictions However, since the connector for peripheral connection is different, A1SD75-C01HA cable is required.
	AD75P1-S3	A1SD75P1-S3	No special restrictions However, since the connector for peripheral connection is different, A1SD75-C01HA cable is required.
	AD75P2-S3	A1SD75P2-S3	No special restrictions However, since the connector for peripheral connection is different, A1SD75-C01HA cable is required.
	AD75P3-S3	A1SD75P3-S3	No special restrictions However, since the connector for peripheral connection is different, A1SD75-C01HA cable is required.

10.2 Special Function Modules Comparison

10.2.1 Analog input modules comparison

(1) Comparisons between A616AD and A1S68AD

(a) Performance specifications comparison

○: Compatible, △: Partial change required, ×: Incompatible

Item	A616AD	A1S68AD	Compati-bility	Precautions for replacement
Analog input	Voltage:-10 to 0 to +10VDC (Input resistance: 1MΩ) Current: -20 to 0 to +20mADC (Input resistance: 250Ω)	Voltage: -10 to 0 to +10VDC (Input resistance: 1MΩ) Current: 0 to +20mA (Input resistance: 250Ω)	△	Negative current cannot be converted.
Digital output	16-bit, signed binary (Data unit: 12 bits) (-48 to 4047, -2048 to +2047) Setting is available for each channel.	16-bit, signed binary	○	
I/O characteristics, maximum resolution	(see table below)	(see table below)	△	Check the I/O conversion characteristics.
Overall accuracy (%) (Accuracy to full-scale)	When using A616AD only 0 to 10V, -10 to 10V -5V to 5V, -20 to 20mA } Range: ±0.3% (Digital value ±12) 0 to 5V, 1 to 5V 0 to 20mA, 4 to 20mA } Range: ±0.6% (Digital value ±24) When using in combination with A60MX, A60MXR, or A60MXRN, the accuracy of each range of A616AD is ±0.3% (Digital output value ±12)	Within ±1% (Digital output value ±40)	×	Overall accuracy differs.
Maximum conversion speed (ms/channel)	When using A616AD only 1 When using with A60MX 1 When using A60MXR 1 (Sampling processing) 7.0 (Direct access processing) When using A60MXRN 1 (Sampling processing) 7.0 (Direct access processing)	0.5ms/channel (The maximum conversion speed is 1 ms/channel on all channels if averaging processing is set even for only one channel.)	○	
Absolute maximum input	Voltage: ±15V Current: ±30mA	Voltage: ±35V Current: ±30mA	○	
Analog input points	16 channels/module	8 channels/module	×	As the number of channels is reduced, the number of modules installed may increase. In addition, the number of channels cannot be increased by connecting a multiplexer module.

A616AD I/O characteristics, maximum resolution:

Input	Analog input range	Maximum resolution	Digital output value
Voltage (V)	0 to +10	2.5mV (1/4000)	0 to 4000 -2000 to 2000
	0 to +5	1.25mV (1/4000)	
	+1 to +5	1.0mV (1/4000)	
	-10 to +10	5.0mV (1/4000)	
	-5 to +5	2.5mV (1/4000)	
Current (mA)	0 to +20	10μA (1/2000)	0 to 2000 -2000 to 0
	0 to +20	5μA (1/4000)	0 to 4000 -2000 to 2000
	+4 to +20	4μA (1/4000)	
	-20 to +20	20μA (1/2000)	1000 to 3000 -1000 to 1000
	-20 to +20	10μA (1/4000)	0 to 4000 -2000 to 2000

A1S68AD I/O characteristics:

Analog input value	Digital output value
0 to +10V	0 to +4000
-10 to +10V	-2000 to +2000
0 to 5V or 0 to 20mA	0 to +4000
1 to 5V or 4 to 20mA	0 to +4000

A1S68AD Maximum resolution:

Analog input value	Digital output value
0 to +10V	2.5mV
-10 to +10V	5mV
0 to +5V	1.25mV
1 to 5V	1mV
0 to 20mA	5μA
4 to 20mA	4μA

MELSEC

○: Compatible, △: Partial change required, ✕: Incompatible

Item	A616AD	A1S68AD	Compati-bility	Precautions for replacement
Isolation method	Between the input terminals and PLC : photocoupler isolation Between channels : non-isolated (1MΩ resistor isolation)	Between the input terminals and PLC power : photocoupler isolation Between channels : non-isolated	○	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal	38-point terminal block	20-point terminal block	✕	External wiring must be changed.
Applicable wire size	0.75 to 2mm^2 (Applicable tightening torque 39 to 59N・cm)	0.75 to 1.5mm^2	△	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A	△	
Internal current consumption (5VDC)	1A	0.4A	○	
External dimensions	250(H)✕37.5(W)✕131(D)mm	130(H)✕34.5(W)✕93.6(D)mm	△	The dimensions are different.
Weight	0.85kg	0.27kg	○	

(b) Function comparison

○: Compatible, △: Partial change required, ×: Incompatible, —: Additional function

Item	A616AD	A1S68AD	Compatibility	Precautions for replacement
Sampling processing	Switches channels in order of channel number at intervals of 1 ms to execute A/D conversion, and stores the digital output values to the buffer memory. Maximum conversion speed is 1ms.	Converts an analog input value to a digital value for each channel at any time, and stores it in the buffer memory as a digital output value. The length of time to store the sampled digital output value in the buffer memory differs depending on the number of the A/D conversion enabled channels. (Processing time) = (Number of A/D conversion enabled channels)× 0.5(ms) *0.5(ms) is maximum conversion speed.	○	
Direct access processing	Separately from normal sampling processing, allows direct A/D conversion of the specified channels by specifying channels and outputting direct access request from a sequence program. When channel specifications with sampling and direct access processings are input simultaneously, the direct access request is prioritized. Maximum conversion speed is 1ms.	—	×	No direct access function
Averaging processing	—	Executes the A/D conversion for the channel specified for averaging process by a PLC CPU for the set number of times or set time. The total values except the maximum and minimum values are averaged and stored in the buffer memory. However, when the processing number of times is no more than two, the sampling process is executed. 1) When the averaging process by time is specified $$\text{(Processing time)} = \frac{\text{Setting time}}{\text{(number of A/D conversion-enabled channels)} \times 1\text{(ms)}}$$ 2) When the number of times for the averaging process is specified (Processing time) = (the setting number of time)× (A/D conversion-enabled channel)×1(ms) 1(ms) is maximum conversion speed.	—	
A/D conversion enable/disable setting	Specifies whether to enable or disable the conversion for each channel and writes it to the buffer memory address FH to 17H. By disabling the conversion for the channels that are not used, the sampling time can be shortened.	Allows the A/D conversion enable/disable setting for each channel by writing "1" (enable) or "0" (disable) to the buffer memory address 0. By disabling the conversion for the channels that are not used, the sampling time can be shortened. (Default: All channels are set to "enable".)	○	
Input range setting	Allows the input range setting for each channel, and change of the I/O conversion characteristics.	Allows the input range setting for each channel, and change of the I/O conversion characteristics.	○	
Offset/gain setting	The I/O characteristics differ slightly between modules according to ambient temperature, A/D converter characteristic variations, etc. The Offset/gain setting allows fine adjustment and corrects this slight difference in characteristics.	—	×	No offset/gain setting function

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A616AD				A1S68AD			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A616AD detection)	Y0		X0	WDT error (A1S68AD detection)	Y0	
X1	A/D conversion READY	Y1		X1	A/D conversion READY	Y1	
X2	Error	Y2		X2	Error	Y2	
X3		Y3		X3		Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8		X8		Y8	Not used
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB	Not used	XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10	Not used	Y10		X10		Y10	
X11		Y11		X11	Not used	Y11	
X12		Y12		X12		Y12	Error reset
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18	Direct access request signal	X18		Y18	
X19		Y19		X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C	Not used	X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A616AD		Read/Write	Address	A1S68AD			
	Name				Name	Default value	Read/Write	
0	For direct access	INPUT designation	R/W	0	A/D conversion enable/ disable specification	00FF$_H$ (All channels are set to "enable".)	R/W	
1		MX. CH. designation		1	Writing data error code	0 (No error)	R	
2		Digital output value	R	2	Average processing specification	0 (Sampling processing specified for all channels)	R/W	
3	Sampling cycle designation		R/W	3	Not used	—	—	
4	Data format selection			4				
5	Error code storage			5				
6	Faulty multiplexer module CNT. No. storage			6				
7	Not used		—	7				
8				8				
9				9				
10				10	CH1 Average time, count	0	R/W	
11				11	CH2 Average time, count	0		
12				12	CH3 Average time, count	0		
13				13	CH4 Average time, count	0		
14				14	CH5 Average time, count	0		
15	Conversion enable/ disable designation	A616AD	R/W	15	CH6 Average time, count	0		
16		INPUT 0 A60MX, A60MXR		16	CH7 Average time, count	0		
17		INPUT 1 A60MX, A60MXR		17	CH8 Average time, count	0		
18		INPUT 2 A60MX, A60MXR		18	Not used	—	—	
19		INPUT 3 A60MX, A60MXR		19				
20		INPUT 4 A60MX, A60MXR		20	CH1 Digital output value	0	R	
21		INPUT 5 A60MX, A60MXR		21	CH2 Digital output value	0		
22		INPUT 6 A60MX, A60MXR		22	CH3 Digital output value	0		
23		INPUT 7 A60MX, A60MXR		23	CH4 Digital output value	0		
24	Set data setting request			24	CH5 Digital output value	0		
25	Not used		—	25	CH6 Digital output value	0		
26				26	CH7 Digital output value	0		
27				27	CH8 Digital output value	0		
28				28	A/D conversion completed	0	R/W	
29 to 47				29	Not used	—	—	
48 to 63	INPUT channel digital output value		R					
64 to 255	Not used		—					
256 to 383	MX.CH. channel digital output value		R					

(2) Comparisons between A68AD and A1S68AD

(a) Performance specifications comparison

○: Compatible, △: Partial change required, ×: Incompatible

Item	A68AD	A1S68AD	Compati-bility	Precautions for replacement
Analog input	Voltage: -10 to 0 to +10VDC (Input resistance:hardware version K or later: 1MΩ, hardware version J or earlier: 30KΩ) Current: +4 to +20mADC (Input resistance: 250Ω) *Usable current input: -20 to 0 to +20mA	Voltage: -10 to 0 to +10VDC (Input resistance: 1MΩ) Current: 0 to +20mA (Input resistance: 250Ω)	△	Negative current cannot be converted.
Digital output	ACPU 16-bit, signed binary (-2048 to +2047) K2ACPU signed + 16-bit binary (±2047)	16-bit, signed binary	○	
I/O characteristics	Analog input / Digital output: +10V → +2000; +5V or +20mA → +1000; 0V or +4mA → ±0; -5V or -12mA → -1000; -10V → -2000	Analog input / Digital output: 0 to +10V → 0 to +4000; -10 to 10V → -2000 to +2000; 0 to 5V or 0 to 20mA → 0 to +4000; 1 to 5V or 4 to 20mA → 0 to +4000	△	Check the I/O conversion characteristics.
Maximum resolution	Voltage: 5mV (1/2000) Current: 20μA (1/1000)	Analog input / Digital output: 0 to +10V → 2.5mV; -10 to 10V → 5mV; 0 to 5V → 1.25mV; 1 to 5V → 1mV; 0 to 20mA → 5μA; 4 to 20mA → 4μA	○	
Overall accuracy	±1%(±20) (Accuracy in respect to maximum digital output value (+2000)) (The same (+2000) for voltage input and current input.)	Within ±1% (Digital output value ±40)	○	
Maximum conversion speed	Max. 2.5ms/channel	0.5ms/channel (The maximum conversion speed is 1 ms/channel on all channels if averaging processing is set even for only one channel.)	○	
Absolute maximum input	Voltage: ±15V Current: ±30mA	Voltage: ±35V Current: ±30mA	○	
Analog input points	8 channels/module	8 channels/module	○	
Isolation method	Between the input terminals and PLC power: photocoupler isolation Between channels : non-isolated	Between the input terminals and PLC power: photocoupler isolation Between channels : non-isolated	○	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal	38-point terminal block	20-point terminal block	×	
Applicable wire size	0.75 to 2mm² (Applicable tightening torque 7kg・cm)	0.75 to 1.5mm²	△	External wiring must be changed.
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A	△	
Internal current consumption (5VDC)	Hardware version K or later: 0.39A, Hardware version J or earlier: 0.9A	0.4A	△	Recalculation of internal current consumption [5VDC] is required.
External dimensions	250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight	Hardware version K or later: 0.3kg, Hardware version J or earlier: 0.6kg	0.27kg	○	

(b) Function comparison

○: Compatible, △: Partial change required, ×: Incompatible, —: Additional function

Item	A68AD	A1S68AD	Compatibility	Precautions for replacement
Sampling processing	Converts analog input values into digital output values successively, and stores the digital output value in the buffer memory. The length of time to store the sampled digital output value in the buffer memory differs depending on the number of channels used. (Processing time) = (Number of channels used) ×2.5 (ms/channel) * 2.5(ms) is maximum conversion speed.	Converts an analog input value to a digital value for each channel at any time, and stores it in the buffer memory as a digital output value. The length of time to store the sampled digital output value in the buffer memory differs depending on the number of the A/D conversion enabled channels. (Processing time) = (Number of A/D conversion enabled channels) ×0.5 (ms) * 0.5(ms) is maximum conversion speed.	○	
Averaging processing	Executes the A/D conversion for the channel specified for averaging process by a PLC CPU for the set number of times or set time. The total values except the maximum and minimum values are averaged and stored in the buffer memory. However, when the processing number of times is no more than two, the sampling process is executed. The applicable setting range is shown below: Count averaging : 1 to 4000 Time averaging: 20 to 10000ms	Executes the A/D conversion for the channel specified for averaging process by a PLC CPU for the set number of times or set time. The total values except the maximum and minimum values are averaged and stored in the buffer memory. However, when the processing number of times is no more than two, the sampling process is executed. The applicable setting range is shown below: Count averaging :1 to 20000 Time averaging : 4 to 10000ms	○	
A/D conversion enable/ disable setting	Set the number of channels for which conversion is enabled to the buffer memory address 0.	Allows the A/D conversion enable/disable setting for each channel by writing "1" (enable) or "0" (disable) to the buffer memory address 0. By disabling the conversion for the channels that are not used, the sampling time cycle can be shortened. (Default: All channels are set to "enable".)	△	Settable for each channel
Input range setting	—	Allows the input range setting for each channel, and change of the I/O conversion characteristics.	—	—
Offset/gain setting	The I/O conversion characteristics can be changed.	—	×	No offset/gain setting function

(c) Comparison I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A68AD				A1S68AD			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A68AD detection)	Y0		X0	WDT error (A1S68AD detection)	Y0	
X1	A/D conversion READY	Y1		X1	A/D conversion READY	Y1	
X2		Y2		X2	Error	Y2	
X3		Y3		X3		Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8		X8		Y8	Not used
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF	Not used	XF		YF	
X10	Not used	Y10		X10		Y10	
X11		Y11		X11	Not used	Y11	
X12		Y12		X12		Y12	Error reset
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	
X19		Y19		X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A68AD			Address	A1S68AD		
	Name	CPU	Read/Write		Name	Default value	Read/Write
0	Number of channels	Common to ACPU and K2ACPU	R/W	0	A/D conversion enable/ disable specification	00FF$_H$ (All channels are set to "enable".)	R/W
1	Average processing specification			1	Writing data error code	0 (All channels)	R
2	CH1 Average time, count			2	Average processing specification	0 (Sampling processing specified for all channels)	R/W
3	CH2 Average time, count			3	Not used	—	—
4	CH3 Average time, count			4			
5	CH4 Average time, count			5			
6	CH5 Average time, count			6			
7	CH6 Average time, count			7			
8	CH7 Average time, count			8			
9	CH8 Average time, count			9			
10	CH1 Digital output value	ACPU		10	CH1 Average time, count	0	R/W
11	CH2 Digital output value			11	CH2 Average time, count	0	
12	CH3 Digital output value			12	CH3 Average time, count	0	
13	CH4 Digital output value			13	CH4 Average time, count	0	
14	CH5 Digital output value			14	CH5 Average time, count	0	
15	CH6 Digital output value			15	CH6 Average time, count	0	
16	CH7 Digital output value			16	CH7 Average time, count	0	
17	CH8 Digital output value			17	CH8 Average time, count	0	
18	CH1 Digital output value	K2ACPU	R	18	Not used	—	—
19	CH1 Positive or negative sign			19			
20	CH2 Digital output value			20	CH1 Digital output value	0	R
21	CH2 Positive or negative sign			21	CH2 Digital output value	0	
22	CH3 Digital output value			22	CH3 Digital output value	0	
23	CH3 Positive or negative sign			23	CH4 Digital output value	0	
24	CH4 Digital output value			24	CH5 Digital output value	0	
25	CH4 Positive or negative sign			25	CH6 Digital output value	0	
26	CH5 Digital output value			26	CH7 Digital output value	0	
27	CH5 Positive or negative sign			27	CH8 Digital output value	0	
28	CH6 Digital output value			28	A/D conversion completed	0	R/W
29	CH6 Positive or negative sign			29	Not used	—	—
30	CH7 Digital output value						
31	CH7 Positive or negative sign						
32	CH8 Digital output value						
33	CH8 Positive or negative sign						
34	Writing data error code	Common to ACPU and K2ACPU	R/W				

(3) Comparisons between A68AD-S2 and A1S68AD

(a) Performance specifications comparison

○: Compatible, △: Partial change required, ×: Incompatible

Item	A68AD-S2	A1S68AD	Compati-bility	Precautions for replacement
Analog input	Voltage: -10 to 0 to +10VDC (Input resistance:Hardware version K or later: 1MΩ, hardware version J or earlier: 30kΩ) Current: +4 to +20mADC (Input resistance: 250Ω) *Usable current input: -20 to 0 to +20mA	Voltage: -10 to 0 to +10VDC (Input resistance: 1MΩ) Current: 0 to +20mA (Input resistance: 250Ω)	△	Negative current cannot be converted.
Digital output	ACPU 16-bit, signed binary (-2048 to +2047) K2ACPU sign+16-bit binary (±2047)	16-bit, signed binary	○	
I/O characteristics	Analog input / Digital output: +10V → +2000 +5V or +20mA → +1000 0V or +4mA → ±0 -5V or -20mA → -1000 -10V → -2000	Analog input / Digital output: 0 to +10V → 0 to +4000 -10 to 10V → -2000 to +2000 0 to 5V or 0 to 20mA → 0 to +4000 1 to 5V or 4 to 20mA → 0 to +4000	△	Check the I/O conversion characteristics.
Maximum resolution	Voltage: 5mV (1/2000) Current: 20μA (1/1000)	Analog input / Digital output: 0 to +10V → 2.5mV -10 to 10V → 5mV 0 to +5V → 1.25mV 1 to 5V → 1mV 0 to 20mA → 5μA 4 to 20mA → 4μA	○	
Overall accuracy	±1%(±20) (Accuracy in respect to maximum digital output value (+2000)) (The same (+2000) for voltage input and current input.)	Within ±1% (Digital output value ±40)	○	
Maximum conversion speed	Max. 2.5ms/channel	0.5ms/channel (The maximum conversion speed is 1ms/channel on all channels if averaging processing is set even for only one channel.)	○	
Absolute maximum input	Voltage: ±15V Current: ±30mA	Voltage: ±35V Current: ±30mA	○	
Analog input points	8 channels/module	8 channels/module	○	
Isolation method	Between the input terminals and PLC power: photocoupler isolation Between channels : non-isolated	Between the input terminals and PLC power: photocoupler isolation Between channels : non-isolated	○	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal	38-point terminal block	20-point terminal block	×	External wiring must be changed.
Applicable wire size	0.75 to 2mm² (Applicable tightening torque 7kg·cm)	0.75 to 1.5mm²	△	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A	△	
Internal current consumption (5VDC)	Hardware version K or later: 0.39A, Hardware version J or earlier: 0.9A	0.4A	△	Recalculation of internal current consumption [5VDC] is required.
External dimensions	250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight	Hardware version K or later: 0.3kg, Hardware version J or earlier: 0.6kg	0.27kg	○	

(b) Function comparison

○: Compatible, △: Partial change required, ×: Incompatible, —: Additional function

Item	A68AD-S2	A1S68AD	Compati-bility	Precautions for replacement
Sampling processing	Converts analog input values into digital output values successively, and stores the digital output value in the buffer memory. The length of time to store the sampled digital output value in the buffer memory differs depending on the number of channels used. (Processing time) = (Number of channels used) $\times$ 2.5 (ms/channel) * 2.5(ms) is maximum conversion speed.	Converts an analog input value to a digital value for each channel at any time, and stores it in the buffer memory as a digital output value. The length of time to store the sampled digital output value in the buffer memory differs depending on the number of the A/D conversion enabled channels. (Processing time) = (Number of A/D conversion enabled channels) $\times$ 0.5 (ms) * 0.5(ms) is maximum conversion speed.	○	
Averaging processing	Executes the A/D conversion for the channel specified for averaging process by a PLC CPU for a set number of times or set time. The total values except the maximum and minimum values are averaged and stored in the buffer memory. However, when the processing number of times is no more than two, the sampling process is executed. The applicable setting range is shown below: Count averaging: 1 to 4000 Time averaging : 20 to 10000ms	Executes the A/D conversion for the channel specified for averaging process by a PLC CPU for the set number of times or set time. The total values except the maximum and minimum values are averaged and stored in the buffer memory. However, when the processing number of times is no more than two, the sampling process is executed. The applicable setting range is shown below: Count averaging: 1 to 20000 Time averaging: 4 to 10000ms	○	
A/D conversion enable/disable setting	Set the number of channels for which the A/D conversion is enabled to the buffer memory address 0. The channel can be specified for each channel. (Used channel specification)	Allows the A/D conversion enable/disable setting for each channel by writing "1" (enable) or "0" (disable) to the buffer memory address 0. By disabling the conversion for the channels that are not used, the sampling time cycle can be shortened. (Default: All channels are set to "enable".)	○	
Input range setting	—	Allows input range setting for each channel, and change of the I/O conversion characteristics.	—	
Offset/gain setting	The I/O conversion characteristics can be changed.	—	×	No offset/gain setting function

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A68AD-S2				A1S68AD			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A68AD-S2 detection)	Y0		X0	WDT error (A1S68AD detection)	Y0	
X1	A/D conversion READY	Y1		X1	A/D conversion READY	Y1	
X2		Y2		X2	Error	Y2	
X3		Y3		X3		Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	Not used
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF	Not used	XF		YF	
X10		Y10		X10		Y10	
X11	Not used	Y11		X11	Not used	Y11	
X12		Y12		X12		Y12	Error reset
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	
X19		Y19		X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A68AD-S2			Address	A1S68AD		
	Name	CPU	Read/Write		Name	Default value	Read/Write
0	Used channel specification	Common to ACPU and K2ACPU	R/W	0	A/D conversion enable/ disable specification	00FF$_H$ (All channels are set to "enable".)	R/W
1	Average processing specification			1	Writing data error code	0 (All channels)	R
2	CH1 Average time, count			2	Average processing specification	0 (Sampling processing specified for all channels)	R/W
3	CH2 Average time, count			3			
4	CH3 Average time, count			4			
5	CH4 Average time, count			5			
6	CH5 Average time, count			6	Not used	—	—
7	CH6 Average time, count			7			
8	CH7 Average time, count			8			
9	CH8 Average time, count			9			
10	CH1 Digital output value	ACPU		10	CH1 Average time, count	0	R/W
11	CH2 Digital output value			11	CH2 Average time, count	0	
12	CH3 Digital output value			12	CH3 Average time, count	0	
13	CH4 Digital output value			13	CH4 Average time, count	0	
14	CH5 Digital output value			14	CH5 Average time, count	0	
15	CH6 Digital output value			15	CH6 Average time, count	0	
16	CH7 Digital output value			16	CH7 Average time, count	0	
17	CH8 Digital output value			17	CH8 Average time, count	0	
18	CH1 Digital output value	K2ACPU	R	18	Not used	—	—
19	CH1 Positive or negative sign			19			
20	CH2 Digital output value			20	CH1 Digital output value	0	R
21	CH2 Positive or negative sign			21	CH2 Digital output value	0	
22	CH3 Digital output value			22	CH3 Digital output value	0	
23	CH3 Positive or negative sign			23	CH4 Digital output value	0	
24	CH4 Digital output value			24	CH5 Digital output value	0	
25	CH4 Positive or negative sign			25	CH6 Digital output value	0	
26	CH5 Digital output value			26	CH7 Digital output value	0	
27	CH5 Positive or negative sign			27	CH8 Digital output value	0	
28	CH6 Digital output value			28	A/D conversion completed	0	R/W
29	CH6 Positive or negative sign			29	Not used	—	—
30	CH7 Digital output value						
31	CH7 Positive or negative sign						
32	CH8 Digital output value						
33	CH8 Positive or negative sign						
34	Writing data error code	Common to ACPU and K2ACPU	R/W				
35	A/D conversion completed		R				

(4) Comparisons between A68ADN and A1S68AD

(a) Performance specifications comparison

○: Compatible, △: Partial change required, ×: Incompatible

Item	A68ADN	A1S68AD	Compati-bility	Precautions for replacement
Analog input	Voltage: -10 to 0 to +10VDC (Input resistance: 1MΩ) Current: -20 to 0 to +20mADC (Input resistance: 250Ω)	Voltage: -10 to 0 to +10VDC (Input resistance: 1MΩ) Current: 0 to +20mA (Input resistance: 250Ω)	△	Negative current cannot be converted.
Digital output	16-bit, signed binary When 1/4000 is set: -4096 to +4095 When 1/8000 is set: -8192 to +8191 When 1/12000 is set: -12287 to +12287	16-bit, signed binary	○	
I/O characteristics	<table><tr><td rowspan="2">Analog input</td><td colspan="3">Digital output value (For gain 5V/20mA, offset 0V/20mA)</td></tr><tr><td>1/4000</td><td>1/8000</td><td>1/12000</td></tr><tr><td>+10V</td><td>+4000</td><td>+8000</td><td>+12000</td></tr><tr><td>+5V or +20mA</td><td>+2000</td><td>+4000</td><td>+6000</td></tr><tr><td>0V or 0mA</td><td>0</td><td>0</td><td>0</td></tr><tr><td>-5V or -20mA</td><td>-2000</td><td>-4000</td><td>-6000</td></tr><tr><td>-10V</td><td>-4000</td><td>-8000</td><td>-12000</td></tr></table> (Factory-set: gain...5V, offset...0V)	<table><tr><td>Analog input</td><td>Digital output</td></tr><tr><td>0 to +10V</td><td>0 to +4000</td></tr><tr><td>-10 to 10V</td><td>-2000 to +2000</td></tr><tr><td>0 to 5V or 0 to 20mA</td><td>0 to +4000</td></tr><tr><td>1 to 5V or 4 to 20mA</td><td>0 to +4000</td></tr></table>	△	Check the I/O conversion characteristics.
Maximum resolution	<table><tr><td></td><td>1/4000</td><td>1/8000</td><td>1/12000</td></tr><tr><td>Voltage input</td><td>2.5mV</td><td>1.25mV</td><td>0.83mV</td></tr><tr><td>Current input</td><td>10μA</td><td>5μA</td><td>3.33μA</td></tr></table>	<table><tr><td>Analog input</td><td>Digital output</td></tr><tr><td>0 to +10V</td><td>2.5mV</td></tr><tr><td>-10 to 10V</td><td>5mV</td></tr><tr><td>0 to 5V</td><td>1.25mV</td></tr><tr><td>1 to 5V</td><td>1mV</td></tr><tr><td>0 to 20mA</td><td>5μA</td></tr><tr><td>4 to 20mA</td><td>4μA</td></tr></table>	×	The resolution decreases.
Overall accuracy (Accuracy in respect to maximum digital output value)	<table><tr><td></td><td>1/4000</td><td>1/8000</td><td>1/12000</td></tr><tr><td>±1%</td><td>±40</td><td>±80</td><td>±120</td></tr></table>	Within ±1% (Digital output value ±40)	○	
Maximum conversion speed	20ms/channel	0.5ms/channel (The maximum conversion speed is 1ms/channel on all channels if averaging processing is set even for only one channel.)	○	
Absolute maximum input	Voltage: ±15V Current: ±30mA	Voltage: ±35V Current: ±30mA	○	
Analog input points	8 channels/module	8 channels/module	○	
Isolation method	<table><tr><td>Isolation position</td><td>Isolation method</td><td>Dielectric withstand voltage</td><td>Insulation resistance</td></tr><tr><td>Between the input terminals and PLC power</td><td>Photocoupler</td><td>500 VAC for 1minute</td><td>500 VDC 5MΩ or more by insulation resistance tester</td></tr><tr><td>Between channels</td><td>non-isolated</td><td>—</td><td>—</td></tr></table>	Between the input terminals and PLC power: photocoupler isolation Between channels : non-isolated	○	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal	38-point terminal block	20-point terminal block	×	External wiring must be changed.
Applicable wire size	0.75 to 2mm² (Applicable tightening torque 7kg·cm)	0.75 to 1.5mm²	△	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A	△	
Internal current consumption (5VDC)	0.4A	0.4A	○	

○: Compatible, △: Partial change required, ×: Incompatible

Item	A68ADN	A1S68AD	Compati-bility	Precautions for replacement
External dimensions	250(H)× 37.5(W)× 131(D)mm	130(H)× 34.5(W)× 93.6(D)mm	△	The dimensions are different.
Weight	0.51kg	0.27kg	○	

(b) Function comparison

○: Compatible, △: Partial change required, ×: Incompatible, —: Additional function

Item	A68ADN	A1S68AD	Compatibility	Precautions for replacement
A/D conversion enable/disable setting	Sets whether to enable or disable the A/D conversion for each channel. By disabling the conversion for the channels that are not used, the sampling time can be shortened. (Default: All channels are set to "enable".)	Allows the A/D conversion enable/disable setting for each channel by writing "1" (enable) or "0" (disable) to the buffer memory address 0. By disabling the conversion for the channels that are not used, the sampling time can be shortened. (Default: All channels are set to "enable".)	○	
Averaging processing	Executes the A/D conversion for the channel specified for averaging process by a PLC CPU for the set number of times or set time. The total values except the maximum and minimum values are averaged and stored in the buffer memory. However, when the processing number of times is no more than two, the sampling process is executed. Data for averaging processing is initialized when the A/D conversion enable/disable is set. The applicable setting range is shown below: Count averaging : 1 to 500 Time averaging : 160 to 10000ms	Executes the A/D conversion for the channel specified for averaging process by a PLC CPU for the set number of times or set time. The total values except the maximum and minimum values are averaged and stored in the buffer memory. However, when the processing number of times is no more than two, the sampling process is executed. The applicable setting range is shown below: Count averaging: 1 to 20000 Time averaging: 4 to 10000ms	○	
Sampling processing	Converts analog input values into digital output values successively, and stores the digital output value in the buffer memory. The length of time to store the sampled digital output value in the buffer memory differs depending on the number of the A/D conversion enabled channels. (Processing time) = (Number of A/D conversion enabled channels) × 20 (ms/channel)	Converts an analog input value is converted to a digital value for each channel at any time, and stores it in the buffer memory as a digital output value. The length of time to store the sampled digital output value in the buffer memory differs depending on the number of the A/D conversion enabled channels. (Processing time) = (Number of A/D conversion enabled channels) × 0.5(ms) * 0.5(ms) is maximum conversion speed.	○	
Input range setting	—	Allows input range setting for each channel, and change of the I/O conversion characteristics.	—	
Offset/gain setting	The I/O conversion characteristics can be changed.	—	×	No offset/gain setting function

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.

For details of the I/O signals and sequence programs, refer to the user's manual.

A68ADN				A1S68AD			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A68ADN detection)	Y0		X0	WDT error (A1S68AD detection)	Y0	
X1	A/D conversion READY	Y1		X1	A/D conversion READY	Y1	
X2	Error	Y2		X2	Error	Y2	
X3		Y3		X3		Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8	Not used	X8		Y8	Not used
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10		X10		Y10	
X11	Not used	Y11		X11	Not used	Y11	
X12		Y12	Error reset	X12		Y12	Error reset
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	
X19		Y19	Not used	X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A68ADN		Address	A1S68AD		Read/Write
	Name	Default value		Name	Default value	
0	A/D conversion enable/ disable specification	00FF$_H$ (All channels are set to "enable".)	0	A/D conversion enable/ disable specification	00FF$_H$ (All channels are set to "enable".)	R/W
1	Average processing specification	0 (Sampling processing specified for all channels)	1	Writing data error code	0 (All channels)	R
2	CH1 Average time, count		2	Average processing specification	0 (Sampling processing specified for all channels)	R/W
3	CH2 Average time, count		3	Not used	—	—
4	CH3 Average time, count		4			
5	CH4 Average time, count	0	5			
6	CH5 Average time, count		6			
7	CH6 Average time, count		7			
8	CH7 Average time, count		8			
9	CH8 Average time, count		9			
10	CH1 Digital output value		10	CH1 Average time, count	0	
11	CH2 Digital output value		11	CH2 Average time, count	0	
12	CH3 Digital output value		12	CH3 Average time, count	0	
13	CH4 Digital output value	0	13	CH4 Average time, count	0	R/W
14	CH5 Digital output value		14	CH5 Average time, count	0	
15	CH6 Digital output value		15	CH6 Average time, count	0	
16	CH7 Digital output value		16	CH7 Average time, count	0	
17	CH8 Digital output value		17	CH8 Average time, count	0	
18	Writing data error code	0 (No error)	18	Not used	—	—
19	A/D conversion completed	00FF$_H$ (A/D conversion completed on all channels)	19			
20	Resolution specification	1(1/4000)	20	CH1 Digital output value	0	
			21	CH2 Digital output value	0	
			22	CH3 Digital output value	0	
			23	CH4 Digital output value	0	
			24	CH5 Digital output value	0	R
			25	CH6 Digital output value	0	
			26	CH7 Digital output value	0	
			27	CH8 Digital output value	0	
			28	A/D conversion completed	0	R/W
			29	Not used	—	—

10.2.2 Analog output modules comparison

(1) Comparisons between A616DAI and A1S68DAI

(a) Performance specifications comparison

○: Compatible, △: Partial change required, ×: Incompatible

Item		A616DAI	A1S68DAI	Compati-bility	Precautions for replacement
Digital input		(1) 16-bit, signed binary (Data unit: 12 bits) (2) Setting range: 0 to 4095	(1) 16-bit, signed binary (2) Setting range: 0 to 4096	○	
Analog output		0 to 20mADC (External load resistance: 0 to 600Ω)	4 to 20mADC (External load resistance: 0 to 600Ω)	△	Conversion is limited to 4 to 20mA.
I/O characteristics		Digital input / Analog output +4000 / +20mA +2000 / +12mA 0 / 4mA	Digital input value / Analog output value 4000 / 20mA 2000 / 12mA 0 / 4mA	△	Conversion is limited to 4 to 20mA.
Digital value resolution		1/4000	1/4000	○	
Analog value maximum resolution		4μA	4μA	○	
Overall accuracy (Accuracy in respect to maximum value)		±0.6%(±120μA) (When ambient temperature is 25℃ : ±0.3%) (±60μA)	±1.0% (±200μA)	×	Overall accuracy differs.
Sampling cycle		1.5+0.5×(Number of D/A conversion enabled channels) (ms)	—		The D/A conversion time is fixed regardless of the D/A conversion value output disable channel setting.
Conversion time		0.5ms (Time required for conversion from 0 to 20mA or 20mA to 0mA)	4 ms or less/8 channels For high frequency of access from the PLC CPU using FROM/TO instructions, this can be extended up to about 6ms.	△	
Output short protection		—	Provided	○	
No. of analog output channels		16 channels/module	8 channels/module	×	As the number of channels is reduced, the number of modules installed may increase.
Isolation method		Between the output terminals and PLC power: photocoupler isolation Between A616DAI channels : non-isolated	Between the output terminals and PLC power: photocoupler isolation Between output channels : non-isolated	○	
Occupied I/O points		32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal		38-point terminal block	20-point terminal block (M3.5×7 screws)	×	External wiring must be changed.
Applicable wire size		0.75 to 2mm²	0.75 to 1.5mm²	△	
Applicable solderless terminal		V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A	△	
Internal current consumption (5VDC)		0.3A	0.85A	△	Recalculation of internal current consumption [5VDC] is required.
External power supply	Voltage	+15VDC/-15VDC	—	△	External power supply is not required.
	Current	+15VDC・・・0.53A/-15VDC・・・0.125V	—		
External dimensions		250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.69kg	0.28kg	○	

(b) Function comparison

○: Compatible, △: Partial change required, ×: Incompatible, —: Additional function

Item	A616DAI	A1S68DAI	Compatibility	Precautions for replacement
Analog output HOLD/CLEAR setting (For all channels)	Using the jumper, specify whether to hold (HOLD) or clear (CLEAR) the analog output before STOP when the ACPU is set to STOP by the RUN key switch, etc. When the ACPU stops operation on detection of an error, the analog output value is 0mA independently of the analog output HOLD/CLEAR setting.	Allows users to select whether to hold the last analog value output at each channel or clear (outputs 0 or 4mA), when the PLC CPU goes into the STOP status, or when digital-to-analog conversion is stopped by an A1S68DAI error: one setting is made for all channels using the HLD/CLR terminal on the front face of the module.	△	Check the analog output status combination list.
D/A conversion disable channel setting (For each channel)	Using the sequence program, specify the channel for which D/A conversion is to be disabled in order to shorten the sampling cycle. (D/A conversion of all 16 channels is enabled when the ACPU is powered up or reset.) (a) D/A conversion enable channel: Performs D/A conversion of the digital value specified from the ACPU. (b) D/A conversion disable channel: Does not perform D/A conversion of the digital value specified from the ACPU.	Allows users to specify whether to output a D/A conversion value of each channel or 4mA by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of setting the D/A conversion value output disable channel setting. (D/A conversion value output enable flag)	△	The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value output disable channel setting.
Analog output disable channel setting (For each channel)	Using the sequence program, specify the channel for which analog value output is to be disabled. (Analog output of all 16 channels is enabled when the ACPU is powered up or reset.) (a) Analog output enable channel: Outputs the offset value or an analog value converted. (b) Analog output disable channel: Outputs 0mA.	Allows users to specify whether to enable or disable the output of analog values to external devices by writing 0/1 to address 0 for each channel in the sequence program. (Analog output enable/disable setting)	○	
Offset/gain setting	The I/O conversion characteristics can be changed.	—	×	No offset/gain setting function. Fixed to 4 to 20mA output. Adjust output with the digital input.

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A616DAI				A1S68DAI			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error	Y0		X0	WDT error (A1S68DAI detection)	Y0	
X1	D/A conversion READY	Y1		X1	D/A conversion READY	Y1	
X2	Error	Y2		X2	Error	Y2	
X3		Y3		X3		Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	Not used
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD	Not used	XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10		X10		Y10	
X11	Not used	Y11		X11	Not used	Y11	
X12		Y12		X12		Y12	
X13		Y13		X13		Y13	D/A conversion value output enable
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	Error reset
X19		Y19		X19		Y19	
X1A		Y1A		X1A		Y1A	
X1B		Y1B	Output batch enable	X1B		Y1B	
X1C		Y1C		X1C		Y1C	Not used
X1D		Y1D	Not used	X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A616DAI		Address	A1S68DAI	
	Name	Read/Write		Name	Default value
0	D/A conversion enable/disable channel	R/W	0	Analog output enable/disable channel	0000H(All channels are set to "enable".)
1	Analog output enable/disable channel		1	CH1 Digital value	0
2	Not used	—	2	CH2 Digital value	
3			3	CH3 Digital value	
4			4	CH4 Digital value	
5			5	CH5 Digital value	
6			6	CH6 Digital value	
7			7	CH7 Digital value	
8			8	CH8 Digital value	
9			9		—
10			10	CH1 Set value check code	0
11			11	CH2 Set value check code	
12			12	CH3 Set value check code	
13			13	CH4 Set value check code	
14			14	CH5 Set value check code	
15			15	CH6 Set value check code	
16	CH0 Digital value	R/W	16	CH7 Set value check code	
17	CH1 Digital value		17	CH8 Set value check code	
18	CH2 Digital value				
19	CH3 Digital value				
20	CH4 Digital value				
21	CH5 Digital value				
22	CH6 Digital value				
23	CH7 Digital value				
24	CH8 Digital value				
25	CH9 Digital value				
26	CHA Digital value				
27	CHB Digital value				
28	CHC Digital value				
29	CHD Digital value				
30	CHE Digital value				
31	CHF Digital value				
32 to 47	Not used	—			
48	CH0 Set value check code	R/W			
49	CH1 Set value check code				
50	CH2 Set value check code				
51	CH3 Set value check code				
52	CH4 Set value check code				
53	CH5 Set value check code				
54	CH6 Set value check code				
55	CH7 Set value check code				
56	CH8 Set value check code				
57	CH9 Set value check code				
58	CHA Set value check code				
59	CHB Set value check code				
60	CHC Set value check code				
61	CHD Set value check code				
62	CHE Set value check code				
63	CHF Set value check code				

(2) Comparisons between A616DAV and A1S68DAV

(a) Performance specifications comparison

○: Compatible, △: Partial change required, ×: Incompatible

Item	A616DAV	A1S68DAV	Compatibility	Precautions for replacement
Digital input	(1) 16-bit, signed binary (Data unit :12 bits) (2) Setting range: -4096 to 4095	(1) 16-bit signed binary (2) Setting range:- 2048 to 2047	△	Setting range differs.
Analog output	(1)When output voltage range setting is 10V····-10V to 0V to +10V (External load resistance: 2kΩ to 1MΩ) (2)When output voltage range setting is 5V····-5V to 0V to +5V (External load resistance: 2kΩ to 1MΩ)	-10 to 0 to 10 VDC (External load resistance: 2kΩ to 1MΩ)	△	No ±5V range setting
I/O characteristics	<table><tr><td rowspan="2">Digital input</td><td colspan="2">Analog output</td></tr><tr><td>5V setting</td><td>10V setting</td></tr><tr><td>+4000</td><td>+5V</td><td>+10V</td></tr><tr><td>+2000</td><td>+2.5V</td><td>+5V</td></tr><tr><td>0</td><td>0V</td><td>0V</td></tr><tr><td>-2000</td><td>-2.5V</td><td>-5V</td></tr><tr><td>-4000</td><td>-5.0V</td><td>-10V</td></tr></table>	<table><tr><td>Digital input</td><td>Analog output</td></tr><tr><td>2000</td><td>10V</td></tr><tr><td>1000</td><td>5V</td></tr><tr><td>0</td><td>0V</td></tr><tr><td>-1000</td><td>-5V</td></tr><tr><td>-2000</td><td>-10V</td></tr></table>	△	Digital input value differs.
Digital value resolution	1/4000	1/2000	×	Resolution is different.
Analog value maximum resolution	Output voltage setting 10V: 2.5mV, Output voltage setting 5V: 1.25mV	5mV	×	Resolution is different.
Overall accuracy	Output voltage setting 10V — ±0.6% (±60mV) (Ambient temperature 0 to 55℃) ±0.3% (±30mV) (Ambient temperature 25℃) Output voltage setting 5V — ±0.6% (±30mV) (Ambient temperature 0 to 55℃) ±0.3% (±15mV) (Ambient temperature 25℃)	±1.0% (±100μA)	×	Overall accuracy differs.
Sampling cycle	1.5+0.5× (Number of D/A conversion enabled channels) (ms)	—		The D/A conversion time is fixed regardless of the D/A conversion value output disable channel setting.
Conversion time	0.5ms (Time required for conversion from -10V to +10V or +10V to -10V)	4 ms or less/8 channels For high frequency of access from the PLC CPU using FROM/TO instructions, this can be extended up to about 6ms.	△	
Absolute maximum output	15V	—	○	
No. of analog output channels	16 channels/module	8 channels/module	×	As the number of channels is reduced, the number of modules installed may increase.
Output short protection	—	Provided	○	
Isolation method	Between the output terminals and PLC power supply: photocoupler isolation Between A616DAV channels : non-isolated	Between the output terminals and PLC power supply: photocoupler isolation Between output channels : non-isolated	○	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal	38-point terminal block	20-point terminal block (M3.5×7 screws)	×	External wiring must be changed.
Applicable wire size	0.75 to 2mm²	0.75 to 1.5mm²	△	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3,V2-YS3A	R1.25-3,1.25-YS3, RAV1.25-3,V1.25-YS3A	△	
Internal current consumption (5VDC)	0.38A	0.85A	△	Recalculation of internal current consumption [5VDC] is required.
External power supply — Voltage	+15VDC/-15VDC	—	△	External power supply is not required.
External power supply — Current	+15VDC···0.2A /-15VDC···0.17A			

○: Compatible, △: Partial change required, ✕: Incompatible

Item	A616DAV	A1S68DAV	Compati-bility	Precautions for replacement
External dimensions	250(H)✕37.5(W)✕131(D)mm	130(H)✕34.5(W)✕93.6(D)mm	△	The dimensions are different.
Weight	0.65kg	0.28kg	○	

(b) Function comparison

○: Compatible, △: Partial change required, ×: Incompatible, ──: Additional function

Item	A616DAV	A1S68DAV	Compati-bility	Precautions for replacement
Analog output HOLD/CLEAR setting (For all channels)	Using the jumper, specify whether to HOLD or CLEAR the analog output before STOP when the ACPU is set to STOP by the RUN key switch, etc. When the ACPU stops operation on detection of an error, the analog output value is 0V independently of the analog output HOLD/CLEAR setting.	Allows users to select whether to hold the last analog value output at each channel or clear (outputs 0 or 4mA), when the PLC CPU goes into the STOP status, or when digital-to-analog conversion is stopped by an A1S68DAV error: one setting is made for all channels using the HLD/CLR terminal on the front face of the module.	△	Check the analog output status combination list.
D/A conversion disable channel setting (For each channel)	Using the sequence program, specify the channel for which D/A conversion is to be disabled in order to shorten the sampling cycle. (D/A conversion of all 16 channels is enabled when the ACPU is powered up or reset.) (a) D/A conversion enable channel: Performs D/A conversion of the digital value specified from the ACPU. (b) D/A conversion disable channel: Does not perform D/A conversion of the digital value specified from the ACPU.	Allows users to specify whether to output a D/A conversion value of each channel or 0V by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value output disable channel setting. (D/A conversion value output enable flag)	△	The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value output disable channel setting.
Analog output disable channel setting (For each channel)	Using the sequence program, specify the channel for which analog value output is to be disabled. (Analog output of all 16 channels is enabled when the ACPU is powered up or reset.) (a) Analog output enable channel: Outputs the offset value or an analog value converted. (b) Analog output disable channel: Outputs 0V.	Allows users to specify whether to enable or disable the output of analog values to external devices by writing 0/1 to address 0 for each channel in the sequence program. (Analog output enable/disable setting)	○	
Offset/gain setting	The I/O conversion characteristics can be changed.	──	×	No offset/gain setting function. Fixed to -10 to 10V output. Adjust output with the digital input.

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A616DAV				A1S68DAV			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error	Y0		X0	WDT error (A1S68DAV detection)	Y0	
X1	D/A conversion READY	Y1		X1	D/A conversion READY	Y1	
X2	Error	Y2		X2	Error	Y2	
X3		Y3		X3		Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	Not used
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD	Not used	XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10		X10		Y10	
X11	Not used	Y11		X11	Not used	Y11	
X12		Y12		X12		Y12	
X13		Y13		X13		Y13	D/A conversion value output enable
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	Error reset
X19		Y19		X19		Y19	
X1A		Y1A		X1A		Y1A	
X1B		Y1B	Output batch enable	X1B		Y1B	
X1C		Y1C		X1C		Y1C	Not used
X1D		Y1D	Not used	X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A616DAV			Address	A1S68DAV		
	Name		Read/Write		Name		Default value
0	D/A conversion enable/disable channel		R/W	0	Analog output enable/disable channel		0000H(All channels are set to "enable".)
1	Analog output enable/disable channel			1	CH1 Digital value		0
2	Not used		—	2	CH2 Digital value		0
3				3	CH3 Digital value		0
4				4	CH4 Digital value		0
5				5	CH5 Digital value		0
6				6	CH6 Digital value		0
7				7	CH7 Digital value		0
8				8	CH8 Digital value		0
9				9	Not used		—
10				10	CH1 Set value check code		0
11				11	CH2 Set value check code		0
12				12	CH3 Set value check code		0
13				13	CH4 Set value check code		0
14				14	CH5 Set value check code		0
15				15	CH6 Set value check code		0
16	CH0 Digital value		R/W	16	CH7 Set value check code		0
17	CH1 Digital value			17	CH8 Set value check code		0
18	CH2 Digital value						
19	CH3 Digital value						
20	CH4 Digital value						
21	CH5 Digital value						
22	CH6 Digital value						
23	CH7 Digital value						
24	CH8 Digital value						
25	CH9 Digital value						
26	CHA Digital value						
27	CHB Digital value						
28	CHC Digital value						
29	CHD Digital value						
30	CHE Digital value						
31	CHF Digital value						
32 to 47	Not used		—				
48	CH0 Set value check code		R/W				
49	CH1 Set value check code						
50	CH2 Set value check code						
51	CH3 Set value check code						
52	CH4 Set value check code						
53	CH5 Set value check code						
54	CH6 Set value check code						
55	CH7 Set value check code						
56	CH8 Set value check code						
57	CH9 Set value check code						
58	CHA Set value check code						
59	CHB Set value check code						
60	CHC Set value check code						
61	CHD Set value check code						
62	CHE Set value check code						
63	CHF Set value check code						

(3) Comparisons between A62DA and A1S62DA

(a) Performance specifications comparison

◯: Compatible, △: Partial change required, ✕: Incompatible

Item	A62DA	A1S62DA	Compati-bility	Precautions for replacement
Digital input	Maximum setting value Voltage: ± 2000 Current : ± 1000	Voltage: -4000 to 4000 Current: 0 to 4000 Voltage: -8000 to 8000 Current: 0 to 8000 Voltage: -12000 to 12000 Current: 0 to 12000	△	Check the I/O conversion characteristics to set the digital value.
Analog output	Voltage : -10 to 0 to +10VDC (external load resistance 500 Ω to 1M Ω) Current : +4 to +20mADC (external load resistance 0 Ω to 600 Ω) Current outputs are usable by -20 to 0 to 20mA.	Voltage:-10 to 0 to +10VDC (external load resistance 2k Ω to1M Ω) Current: 0 to 20mADC (external load resistance 0 Ω to 600 Ω)	△	External load resistance must be checked at voltage output. Negative current cannot be output.
I/O characteristics	(see table below)	(see table below)	△	Check the I/O conversion characteristics.
Maximum resolution	Voltage: 5mV (1/2000) Current: 20 μ A (1/1000)	1/4000 2.5mV(10V) 5 μ A(20mA) 1/8000 1.25mV(10V) 2.5 μ A(20mA) 1/12000 0.83mV(10V) 1.7 μ A(20mA)	◯	
Overall accuracy (Accuracy in respect to maximum analog output value)	± 1% (Voltage: ± 0.1V, current: ± 0.2mA)	± 1% (Voltage: ± 100mV, current: ± 200 μ A)	◯	
Maximum conversion speed	Within 15ms/2 channels (same for 1 channel) Note) Time period from digital input write until specified analog voltage(current) reached.	Within 25ms/2 channels (same for 1 channel)	✕	Conversion speed is reduced.
Absolute maximum output	Voltage: ± 12V Current: ± 28mA Note) The voltage or current exceeding the above is not output by output protection circuit.	Voltage: ± 12V Current: +28mA	◯	
Output short protection	Provided	Provided	◯	
Number of analog output points	2 channels/module	2 channels/module	◯	
Isolation method	Between the output terminals and PLC power supply: photocoupler isolation Between channels : non-isolated	Between the output terminals and PLC power supply: photocoupler isolation Between channels : non-isolated	◯	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	◯	
Connected terminal	20-point terminal block	20-point terminal block	△	External wiring must be changed.
Applicable wire size	0.75 to 2mm² (Applicable tightening torque:39 to 59N・cm)	0.75 to 1.5mm²	△	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	1.25-3, 1.25-YS3A, V1.25-3, V1.25-YS3A	△	
Internal current consumption (5VDC)	0.6A	0.8A	△	Recalculation of internal current consumption [5VDC] is required.
External power supply — Voltage	21.6 to 26.4VDC	—	△	External power supply is not required.
External power supply — Current	0.35A	—		
Inrush current	2.4A	—		
External dimensions	250(H)× 37.5(W)× 121(D)mm	130(H)× 34.5(W)× 93.6(D)mm	△	The dimensions are different.

I/O characteristics — A62DA

Digital input	Analog output Voltage	Analog output Current
+2000	+10V	—
+1000	+5V	+20mA
0	0V	+4mA
-1000	-5V	-12mA
-2000	-10V	—

I/O characteristics — A1S62DA

	Resolution 1/4000	Resolution 1/8000	Resolution 1/12000	Voltage output value[*1]	Current output value[*2]
Digital input value	4000	8000	12000	10V	20mA
	2000	4000	6000	5V	12mA
	0	0	0	0	4mA
	-2000	-4000	-6000	-5V	
	-4000	-8000	-12000	-10V	

*1. Offset for voltage output : 0V, Gain: 10V (Factory-set)
*2. Offset for current output : 4mA, Gain: 20mA

◯ : Compatible, △ : Partial change required, ✕ : Incompatible

Item	A62DA	A1S62DA	Compati-bility	Precautions for replacement
Weight	0.5kg	0.32kg	◯	

(b) Function comparison

○: Compatible, △: Partial change required, ✕: Incompatible, —: Additional function

Item	A62DA	A1S62DA	Compati-bility	Precautions for replacement
Output HOLD/CLEAR setting	—	Allows users to select whether to hold the last analog value output at each channel or clear (offset value or 0V/0mA output), when the PLC CPU is in STOP, or when the D/A conversion is stopped by this module because of an error. One setting can be set for all channels with the HOLD/CLEAR terminal.	—	—
D/A conversion execute/ non-execute setting function	—	Allows users to specify whether to output a D/A conversion value for each channel or an offset value by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value output disable channel setting.	—	—
Analog value external output enable/disable setting function	—	Allows users to specify whether to enable or disable the output of analog values to external devices by writing 0/1 to address 0 for each channel in the sequence program.	—	—

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A62DA				A1S62DA			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A62DA detection)	Y0		X0	WDT error (A1S62DA detection)	Y0	
X1	D/A conversion READY	Y1		X1	D/A conversion READY	Y1	
X2		Y2		X2	Error	Y2	
X3		Y3		X3		Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	Not used
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC	Not used	XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10	Not used	Y10		X10	Not used	Y10	CH1 D/A conversion output enable
X11		Y11		X11		Y11	CH2 D/A conversion output enable
X12		Y12		X12		Y12	
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	Not used
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18	CPU select signal	X18		Y18	Error reset
X19		Y19	Sign of CH1 digital input	X19		Y19	
X1A		Y1A	Sign of CH2 digital input	X1A		Y1A	
X1B		Y1B	Output enable	X1B		Y1B	
X1C		Y1C		X1C		Y1C	Not used
X1D		Y1D	Not used	X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A62DA		Address	A1S62DA		
	Name	Read/Write		Name	Default value	Read/Write
0	CH1 Digital value	R/W	0	Analog output enable/disable channel	0	R/W
1	CH2 Digital value		1	CH1 Digital value	0	
2	CH1 Voltage set value check code		2	CH2 Digital value	0	
3	CH2 Voltage set value check code		3	Not used	—	—
4	CH1 Current set value check code		4			
5	CH2 Current set value check code		5			
			6			
			7			
			8			
			9	Resolution of digital value	1($\times$ 1)	R/W
			10	CH1 Set value check code	0	
			11	CH2 Set value check code	0	
			12	Not used	—	—
			13			
			14			
			15			
			16			
			17			

(4) Comparisons between A62DA-S1 and A1S62DA

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, ✕ : Incompatible

Item	A62DA-S1	A1S62DA	Compati-bility	Precautions for replacement
Digital input	0 to +4000	Voltage: -4000 to 4000 　　 Current: 0 to 4000 Voltage: -8000 to 8000 　　 Current: 0 to 8000 Voltage: -12000 to 12000 　 Current: 0 to 12000	△	Check the I/O conversion characteristics to set the digital value.
Analog output	Voltage: 0 to +10VDC (external load resistance: 500 Ω to 1M Ω) Current : +4 to +20mADC (external load resistance 0 Ω to 600 Ω) Current outputs are usable by 0 up to 20mA.	Voltage: -10 to 0 to +10VDC (external load resistance 2k Ω to 1M Ω) Current : 0 to +20mADC (external load resistance 0 to 600 Ω)	△	External load resistance must be checked at voltage output.
I/O characteristics	<table><tr><td>Output range</td><td>Digital input</td><td>Analog output</td></tr><tr><td rowspan=2>0 to 10V</td><td>+4000</td><td>+10V</td></tr><tr><td>0</td><td>0V</td></tr><tr><td rowspan=2>0 to 5V 0 to 20mA</td><td>+4000</td><td>+5V or +20mA</td></tr><tr><td>0</td><td>0V or 0mA</td></tr><tr><td rowspan=2>1 to 5V 4 to 20mA</td><td>+4000</td><td>+5V or +20mA</td></tr><tr><td>0</td><td>+1V or +4mA</td></tr></table>	<table><tr><td rowspan=2>Digital input value</td><td colspan=3>Resolution</td><td>Voltage output value*1</td><td>Current output value*2</td></tr><tr><td>1/4000</td><td>1/8000</td><td>1/12000</td></tr><tr><td>4000</td><td>8000</td><td>12000</td><td>10V</td><td>20mA</td></tr><tr><td>2000</td><td>4000</td><td>6000</td><td>5V</td><td>12mA</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>4mA</td></tr><tr><td>-2000</td><td>-4000</td><td>-6000</td><td>-5V</td><td></td></tr><tr><td>-4000</td><td>-8000</td><td>-12000</td><td>-10V</td><td></td></tr></table> *1. Offset for voltage output : 0V, Gain: 10V (Factory-set) *2. Offset for current output : 4mA, Gain: 20mA	△	Check the I/O conversion characteristics.
Maximum resolution — Voltage	1 to 5V :1mV (1/4000) 0 to 5V :1.25mV (1/4000) 0 to 10V :2.5mV (1/4000)	1/4000 2.5mV (10V) 1/8000 1.25mV (10V) 1/12000 0.83mV (10V)	○	
Maximum resolution — Current	4 to 20mA: 4 μ A (1/4000) 0 to 20mA: 5 μ A (1/4000)	1/4000 5 μ A (20mA) 1/8000 2.5 μ A (20mA) 1/12000 1.7 μ A (20mA)	○	
Overall accuracy (Accuracy in respect to maximum value)	<table><tr><td>Output range Temperature range</td><td>1 to 5V</td><td>0 to 5V</td><td>0 to 10V</td><td>4 to 20mA</td><td>0 to 20mA</td></tr><tr><td>25℃ (±Within 0.5%)</td><td>±25mV</td><td>±25mV</td><td>±50mV</td><td>±0.1mA</td><td>±0.1mA</td></tr><tr><td>0 to 55℃ (±Within 1%)</td><td>±50mV</td><td>±50mV</td><td>±100mV</td><td>±0.2mA</td><td>±0.2mA</td></tr></table>	± 1% (Voltage: ± 100mV, current: ± 200 μA)	△	Fixed regardless of the output range.
Maximum conversion speed	Within 15ms/2 channels (Same for 1channel) Note)Time period from digital input write until specified analog voltage(current) reached.	Within 25ms/2 channels (Period for 1channel is also the same)	✕	Conversion speed is reduced.
Absolute maximum output	Voltage: 0 to +12V Current: 0 to +28mA Note)The voltage or current exceeding the above is not output due to output protection circuit.	Voltage: ± 12V Current: +28mA	○	
Output short protection	Provided	Provided	○	
Number of analog output points	2 channels/module	2 channels/module	○	
Isolation method	Between the output terminals and PLC power supply: photocoupler isolation Between channels : non-isolated	Between the output terminals and PLC power supply: photocoupler isolation Between channels : non-isolated	○	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	

○: Compatible, △: Partial change required, ×: Incompatible

Item		A62DA-S1	A1S62DA	Compati-bility	Precautions for replacement
Connected terminal		20-point terminal block	20-point terminal block	△	External wiring must be changed.
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 39 to 59N・cm)	0.75 to 1.5mm^2	△	
Applicable solderless terminal		V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	1.25-3, 1.25-YS3A, V1.25-3, V1.25-YS3A	△	
Internal current consumption (5VDC)		0.6A	0.8A	△	Recalculation of internal current consumption [5VDC] is required.
External power supply	Voltage	21.6 to 26.4VDC	—	△	External power supply is not required.
	Current	0.35A			
Inrush current		2.4A	—		
External dimensions		250(H)×37.5(W)×121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.5kg	0.32kg	○	

(b) Function comparison

○: Compatible, △: Partial change required, ×: Incompatible, —: Additional function

Item	A62DA-S1	A1S62DA	Compati-bility	Precautions for replacement
Output HOLD/CLEAR function	The HOLD/CLEAR of analog output can be set by the setting pin. 1) HOLD side: Holds the value before the output enable signal is OFF. 2) CLEAR side: Outputs the offset value.	When the PLC CPU goes into STOP, or when D/A conversion of this module is stopped by an error, whether to hold the last analog value output from each channel or to clear it (offset value or 0V/0mA output) can be selected. This is selected for all channels with the HOLD/CLEAR terminal.	△	Check the analog output status combination list.
D/A conversion enable/disable function	—	Allows users to specify whether to output a D/A conversion value for each channel or an offset value by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value output disable channel setting.	—	—
Analog output enable/disable function	—	Allows users to specify whether to enable or disable the output of analog values to external devices by writing 0/1 to address 0 for each channel in the sequence program.	—	—

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A62DA-S1				A1S62DA			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A62DA-S1 detection)	Y0	Not used	X0	WDT error (A1S62DA detection)	Y0	Not used
X1	D/A conversion READY	Y1		X1	D/A conversion READY	Y1	
X2	Not used	Y2		X2	Error	Y2	
X3		Y3		X3	Not used	Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10		X10		Y10	CH1 D/A conversion output enable
X11		Y11		X11		Y11	CH2 D/A conversion output enable
X12		Y12		X12		Y12	Not used
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	Error reset
X19		Y19		X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B	Output enable	X1B		Y1B	
X1C		Y1C	Not used	X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence program is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A62DA-S1		Address	A1S62DA		
	Name	Read/Write		Name	Default value	Read/Write
0	CH1 Digital value		0	Analog output enable/disable channel	0	
1	CH2 Digital value		1	CH1 Digital value	0	R/W
2	CH1 Upper limit check code		2	CH2 Digital value	0	
3	CH1 Lower limit check code	R/W	3			
4	CH2 Upper limit check code		4			
5	CH2 Lower limit check code		5	Not used	—	—
			6			
			7			
			8			
			9	Resolution of digital value	1 (× 1)	
			10	CH1 Set value check code	0	R/W
			11	CH2 Set value check code	0	
			12			
			13			
			14	Not used	—	—
			15			
			16			
			17			

(5) Comparisons between A68DAI-S1 and A1S68DAI

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, ×: Incompatible

Item	A68DAI-S1	A1S68DAI	Compatibility	Precautions for replacement
Digital input	(1) 16-bit, signed binary value (2) Setting range: Set resolution / Setting range: 1/4000 → 0 to 4000 1/8000 → 0 to 8000 1/12000 → 0 to 12000	(1) 16-bit, signed binary value (2) Setting range: 0 to 4096	△	Only 0 to 4096 for setting range
Analog output	0 to 20mADC (external load resistance: 0 to 600 Ω)	4 to 20mADC (external load resistance: 0 to 600 Ω)	△	Output less than 4mA is not allowed.
I/O characteristics	Digital value resolution (1/4000, 1/8000, 1/12000) / Analog output value: 4000 / 8000 / 12000 → +20mA 2000 / 4000 / 6000 → +12mA 0 / 0 / 0 → +4mV *For offset value 4mA, gain value 20mA settings	Digital input value / Analog output value: 4000 → 20mA 2000 → 12mA 0 → 4mA	△	I/O conversion characteristics are fixed as in the left.
Maximum resolution of analog value	5.0 μ A (1/4000) 2.5 μ A (1/8000) 1.6 μ A (1/12000)	4 μ A	○	
Overall accuracy (Accuracy in respect to maximum value)	± 1.0% (± 200 μ A)	± 1.0% (± 200 μ A)	○	
Conversion speed	Within 40ms/8 channel (Same for 1 channel) Note) Time period from digital input write until specified analog voltage (current) reached.	Within 4 ms/8 channels For high frequency of access from the PLC CPU using FROM/TO instructions, this can be extended up to about 6ms.	○	
Absolute maximum output	0 to +28mA Note) The current exceeding the above is not output due to output protection circuit.	—	○	
Number of analog output points	8 channels/module	8 channels/module	○	
Output short protection	—	Provided	○	
Crossover wiring for common	Available	N/A	×	
Isolation method	Between the output terminals and PLC power supply: photocoupler isolation Between channels : non-isolated	Between the output terminals and PLC power supply: photocoupler isolation Between output channels : non-isolated	○	
Number of occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal	38-point terminal block	20-point terminal block (M3.5×7 screws)	×	
Applicable wire size	0.75 to 2mm^2 (applicable tightening torque 39 to 59N·cm)	0.75 to 1.5mm^2	△	External wiring must be changed.
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3A, RAV1.25-3, V1.25-YS3A	△	
Internal power consumption (5VDC)	0.15A	0.85A	△	Recalculation of internal current consumption [5VDC] is required.

◯: Compatible, △ : Partial change required, ✕ : Incompatible

Item		A68DAI-S1	A1S68DAI	Compati-bility	Precautions for replacement
External power supply	Voltage	21.6 to 26.4VDC	—	△	External power supply is not required.
	Current	0.4A			
External dimensions		250(H)✕ 37.5(W)✕ 131(D)mm	130(H)✕ 34.5(W)✕ 93.6(D)mm	△	The dimensions are different.
Weight		0.65kg	0.28kg	◯	

(b) Function comparison

◯: Compatible, △ : Partial change required, ✕ : Incompatible, —: Additional function

Item	A68DAI-S1	A1S68DAI	Compati-bility	Precautions for replacement
HOLD/ CLEAR setting	Allows users to select whether to hold the last analog value output from each channel or to clear it (offset value or 0mA output), when the PLC CPU goes into the STOP status, or when digital-to-analog conversion is stopped by an A68DAI-S1 error: one setting is made for all channels using the HLD/CLR terminal on the front face of the module.	Allows users to select whether to hold the last analog value output from each channel or to clear it (0 or 4mA output), when the PLC CPU goes into the STOP status, or when digital-to-analog conversion is stopped by an A1S68DAI error: one setting is made for all channels using the HLD/CLR terminal on the front face of the module.	△	Since A1S68DAI does not have the offset adjustment, the offset value is not output, and 0 μ A is output when cleared.
D/A conversion value output enable flag	Allows users to specify whether to output a D/A conversion value for each channel or an offset value by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value disable channel setting.	Allows users to specify whether to output a D/A conversion value for each channel or 4mA by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value disable channel setting .	△	Check the analog output status combination list.
Analog output enable/ disable	Allows specifying whether to enable or disable analog value output to external devices by writing 0/1 to address 0 for each channel in the sequence program.		◯	
Offset/gain setting	The I/O conversion characteristics can be changed.	—	✕	No offset/gain setting function. Fixed to 4 to 20mA output. Adjust output with the digital input.

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A68DAI-S1				A1S68DAI			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A68DAI-S1 detection)	Y0	Not used	X0	WDT error (A1S68DAI detection)	Y0	Not used
X1	D/A conversion READY	Y1		X1	D/A conversion READY	Y1	
X2	Not used	Y2		X2	Error	Y2	
X3		Y3		X3	Not used	Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10	D/A conversion output enable	X10		Y10	D/A conversion output enable
X11		Y11		X11	Not used	Y11	
X12		Y12		X12		Y12	
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18	Error reset	X18		Y18	Error reset
X19		Y19	Not used	X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A68DAI-S1		A1S68DAI	
	Buffer memory name	Default value	Name	Default value
0	Analog output enable/disable channel	0000H (All channels are set to "enable".)	Analog output enable/disable channel	0000H (All channels are set to "enable".)
1	CH1 Digital value	0	CH1 Digital value	0
2	CH2 Digital value		CH2 Digital value	
3	CH3 Digital value		CH3 Digital value	
4	CH4 Digital value		CH4 Digital value	
5	CH5 Digital value		CH5 Digital value	
6	CH6 Digital value		CH6 Digital value	
7	CH7 Digital value		CH7 Digital value	
8	CH8 Digital value		CH8 Digital value	
9	Resolution of digital value	1(1/4000)	Not used	—
10	CH1 Set value check code	0	CH1 Set value check code	0
11	CH2 Set value check code		CH2 Set value check code	
12	CH3 Set value check code		CH3 Set value check code	
13	CH4 Set value check code		CH4 Set value check code	
14	CH5 Set value check code		CH5 Set value check code	
15	CH6 Set value check code		CH6 Set value check code	
16	CH7 Set value check code		CH7 Set value check code	
17	CH8 Set value check code		CH8 Set value check code	

(6) Comparisons between A68DAV and A1S68DAV

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, ✕ : Incompatible

Item	A68DAV	A1S68DAV	Compati-bility	Precautions for replacement
Digital input	(1) 16-bit, signed binary value (2) Setting range: 	Setting resolution	Setting range
---	---
1/4000	-4000 to 4000
1/8000	-8000 to 8000
1/12000	-12000 to 12000		(1) 16-bit, signed binary value (2) Setting range: -2048 to 2047	△	Only -2048 to 2047 for setting range
Analog output	-10 to 0 to 10 VDC (External load resistance: 2kΩ to 1MΩ)	10 to 0 to 10 VDC (External load resistance: 2kΩ to 1MΩ)	○	
I/O characteristics	Digital input value / Digital value resolution: 		1/4000	1/8000	1/12000	*Analog output value
	4000	8000	12000	+10V
	2000	4000	6000	+5V
	0	0	0	0V
	-2000	-4000	-6000	-5V
	-4000	-8000	-12000	-10V | *When offset value 0V, gain value 10V settings		Digital input value	Analog output value
---	---
2000	10V
1000	5V
0	0V
-1000	-5V
-2000	-10V		△	I/O conversion characteristics are fixed as in the left.
Maximum resolution of analog value	2.5mV (1/4000) 1.25mV (1/8000) 0.83mV (1/12000)	5mV	✕	Resolution is different.
Overall accuracy (Accuracy in respect to maximum value)	±1.0% (±100mV)	±1.0% (±100mV)	○	
Conversion speed	Within 40ms/8 channel (Same for 1 channel) Note) Time period from digital input write until specified analog voltage (current) reached.	Within 4 ms/8 channels For high frequency of access from the PLC CPU using FROM/TO instructions, this can be extended up to about 6ms.	○	
Absolute maximum output	-12 to +12V Note) The voltage exceeding the above is not output due to output protection circuit.	—	○	
Number of analog output points	8 channels/module	8 channels/module	○	
Output short protection	—	Provided	—	
Isolation method	Between the output terminals and PLC power supply: photocoupler isolation Between channels: non-isolated	Between the output terminals and PLC power supply: photocoupler isolation Between output channels: non-isolated	○	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal	38-point terminal block	20-point terminal block (M3.5×7 screws)	✕	External wiring must be changed.
Applicable wire size	0.75 to 2mm^2 (Applicable tightening torque 39 to 59N·cm)	0.75 to 1.5mm^2	△	External wiring must be changed.
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3A, RAV1.25-3, V1.25-YS3A	△	
Internal power consumption (5VDC)	0.15A	0.65A	△	Recalculation of internal current consumption [5VDC] is required.

○ : Compatible, △ : Partial change required, ✕ : Incompatible

Item		A68DAV	A1S68DAV	Compati-bility	Precautions for replacement
External power supply	Voltage	21.6 to 26.4VDC	—	△	External power supply is not required.
	Current	0.2A			
External dimensions		250(H)× 37.5(W)× 131(D)mm	130(H)× 34.5(W)× 93.6(D)mm	△	The dimensions are different.
Weight		0.6kg	0.28kg	○	

(b) Function comparison

○: Compatible, △ : Partial change required, ×: Incompatible, ▬: Additional function

Item	A68DAV	A1S68DAV	Compati-bility	precautions for replacement
HOLD/ CLEAR setting	When the PLC CPU is in STOP, or when D/A conversion is stopped in A68DAV by an error, whether to hold the last analog value output or to clear it (offset value or 0V output) can be selected for all channels with the HOLD/CLEAR terminal on the front face.	When the PLC CPU is in STOP, or when D/A conversion is stopped in A1S68DV by an error, whether to hold the last analog value output or to clear it (0V output) may be selected for all channels with the HOLD/CLEAR terminal on the front face.	△	Since A1S68DAI does not have the offset adjustment, the offset value is not output, and 0V is output when cleared.
D/A conversion value output enable flag	Allows users to specify whether to output a D/A conversion value or an offset value by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value disable channel setting.	Allows users to specify whether to output a D/A conversion value or 0V by setting the D/A conversion value output enable flag to ON/OFF in the sequence program. The D/A conversion time (conversion speed) is fixed regardless of the D/A conversion value disable channel setting.	△	Check the analog output status combination list.
Analog output enable/disable setting	Allows specifying whether to enable or disable analog value output to external devices by writing 0/1 to address 0 for each channel in the sequence program.		○	
Offset/gain setting	Provided	Not provided	×	No offset/gain setting function. Fixed to -10 to 10V output. Adjust output with the digital input.

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A68DAV				A1S68DAV			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A68DAV detection)	Y0	Not used	X0	WDT error (A1S68DAV detection)	Y0	Not used
X1	D/A conversion READY	Y1		X1	D/A conversion READY	Y1	
X2	Error	Y2		X2	Error	Y2	
X3	Not used	Y3		X3	Not used	Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10	D/A conversion output enable	X10		Y10	D/A conversion output enable
X11		Y11		X11		Y11	
X12		Y12		X12		Y12	
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18	Error reset	X18		Y18	Error reset
X19		Y19	Not used	X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A68DAV		A1S68DAV	
	Name	Default value	Name	Default value
0	Analog output enable/disable channel	0000H (All channels are set to "enable".)	Analog output enable/disable channel	0000H (All channels are set to "enable".)
1	CH1 Digital value	0	CH1 Digital value	0
2	CH2 Digital value		CH2 Digital value	
3	CH3 Digital value		CH3 Digital value	
4	CH4 Digital value		CH4 Digital value	
5	CH5 Digital value		CH5 Digital value	
6	CH6 Digital value		CH6 Digital value	
7	CH7 Digital value		CH7 Digital value	
8	CH8 Digital value		CH8 Digital value	
9	Resolution of digital value	1(1/4000)	Not used	—
10	CH1 Set value check code	0	CH1 Set value check code	0
11	CH2 Set value check code		CH2 Set value check code	
12	CH3 Set value check code		CH3 Set value check code	
13	CH4 Set value check code		CH4 Set value check code	
14	CH5 Set value check code		CH5 Set value check code	
15	CH6 Set value check code		CH6 Set value check code	
16	CH7 Set value check code		CH7 Set value check code	
17	CH8 Set value check code		CH8 Set value check code	

10.2.3 Temperature input module comparison

(1) Comparisons between A616TD and A1S68TD

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, × : Incompatible

Item		A616TD (A60MXT, A60MXTN when using the combination.)	A1S68TD	Compati-bility	Precautions for replacement
Temperature sensor input		-200 to 1800[℃]	0 to 1700[℃]	△	Input temperature range differs.
Output	Digital output value	16-bit, signed binary (0 to 4000) (data unit: 12 bits)	16-bit, signed binary (0 to 2000) *Scaling value	×	Changes 0 to 4000→0 to 2000.
	Detected temperature value	16-bit, signed binary (-2000 to 18000: value to 1 decimal place× 10)	16-bit, signed binary (0 to 17000: value to 1 decimal place× 10)	△	Detected temperature range differs.
Applicable thermocouple		Refer to (e) Applicable thermocouples and measured temperature range accuracies.	Refer to (e) Applicable thermocouples and measured temperature range accuracies.	△	Check the applicable thermocouple.
Measured temperature range accuracies		Refer to (e) Applicable thermocouples and measured temperature range accuracies.	Refer to (e) Applicable thermocouples and measured temperature range accuracies.	×	Conversion accuracy differs.
Overall accuracy [%]		Shown in the list of (e) Applicable thermocouples and measured temperature range accuracies. Measured temperature range accuracies ± 0.5℃	Conversion accuracy + Temperature characteristic × Operating ambient temperature variation + ± 1℃ (Cold junction compensation accuracy)		
Cold junction compensation accuracy range		-20 to 80 [℃] (RTD Pt100 included)	—	—	
Maximum conversion speed		50ms/channel	400ms/8 channel	△	Sampling period is not changed according to No. of channels used.
Isolation method		Between the input terminals and PLC: photocoupler isolation Between channels: non-isolated (1MΩ resistor isolation)	<table><tr><td>Specific isolation area</td><td>Isolation method</td><td>Dielectric withstand voltage</td><td>Insulation resistance</td></tr><tr><td>Between thermocouple input and PLC power supply</td><td rowspan=2>Transformer isolation</td><td rowspan=2>500VAC for 1 minute</td><td rowspan=2>5MΩ or higher with a 500VDC insulation resistance tester</td></tr><tr><td>Between thermocouple input channels</td></tr><tr><td>Between the cold junction compensation input (Pt100) and PLC power supply</td><td>Not isolated</td><td>—</td><td>—</td></tr></table>	○	
Temperature sensor input points		15point/A60MXT, A60MXTN (Up to 7 A60MXT/A60MXTN can be connected to each A616TD.)	8 channels+Pt100 connection channel/module	×	Since the number of channels is reduced, the number of modules installed may increase. In addition, the number of channels cannot be increased by connecting a multiplexer module.
Occupied I/O points		32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)	○	
Connected terminal		38-point terminal block	20-point terminal block	×	External wiring must be changed.
Applicable wire size		0.75 to 2mm^2 (Applicable tightening torque 39 to 59N·cm)	0.75 to 1.5mm^2	△	
Applicable solderless terminal		V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	R1.25-3, 1.25-YS3A, RAV1.25-3, V1.25-YS3A	△	

○: Compatible, △ : Partial change required, ✕ : Incompatible

Item	A616TD (A60MXT, A60MXTN when using the combination.)	A1S68TD	Compati-bility	Precautions for replacement
Internal current consumption (5VDC)	1.0 A	0.32 A	○	
External dimensions	250(H)×37.5(W)×131(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight	0.85kg	0.28kg	○	

(b) Function comparison

○: Compatible, △ : Partial change required, × : Incompatible, —: Additional function

Item	A616TD	A1S68TD	Compati-bility	Precautions for replacement
Conversion enable/ disable function	Write "0" or "1", respectively, to the buffer memory addresses F_H to 17_H to disable or enable conversion for each channel. A default value is written to address F_H when the power supply is turned on or the PLC CPU is reset to enable conversion for all channels. In addresses 10H to 17H, conversion enable setting for all channels is written to the area of CNT. No. set to an A60MXT, and conversion disable setting to the area of CNT. No. not set to it.	Specifies whether to enable or disable A/D conversion for each channel of A1S68TD. A value, "0000(H)" (All channels disabled) in set as default when the power supply is turned on or the PLC CPU is reset. Only channels to be used are set to enable A/D conversion. (When channels unused are set to enable A/D conversion, a disconnection detection error occurs.) * Conversion speed is not changed by No. of channels used.	△	Conversion speed is fixed regardless of No. of channels used.
Disconnection detection function	This function is provided to detect electrical discontinuities in thermocouples and compensating leads connected to the A60MXT. If a break occurs in a thermocouple lead or a compensating lead, the A60MXT internal discontinuity detection circuit outputs a voltage to the A616TD, which is equivalent to an out-of-range detected temperature value. The A616TD detects the discontinuity from the out-of-range voltage and stores the value "1" for the appropriate channel in the discontinuity detection area of the buffer memory and turns on the discontinuity error signal. This function can be enabled or disabled for each channel by setting the disconnection detection switches and buffer memory disconnection detection channels in buffer memory.	When disconnection occurs in a thermocouple, the disconnection detection flag signal (X3) is turned ON, and "1" is stored in the bit area corresponding to the channel No. in the buffer memory. When the disconnection detection flag is turned ON, the digital value exceeds the measured temperature range specified by the thermocouple used, to the + side. Remove disconnection causes and then turn ON the error reset signal (Y12) using the sequence program. Doing this turns OFF the disconnection detection flag signal (X3), and resets all the disconnection detection flags in the buffer memory area.	○	
Converted temperature value storage	The temperatures detected by the temperature sensors (thermocouples) are input to respective A60MXT channels as thermoelectromotive forces. The A60MXT switches input channels once at sampling cycles and amplifies the voltage input to each channel from its respective thermocouple into a voltage of 0 to 10V, and sends this voltage to the A616TD. The A616TD converts the analog input voltages to digital values. As the relationship between the thermoelectromotive force and the temperature detected by a temperature sensor (thermocouple) is non-linear, converted digital values are linearized before being stored in the buffer memory.	The temperature detected for each channel is linearized and converted to the converted temperature value with cold junction temperature compensation to be stored in the buffer memory. The converted temperature value is "measured temperature × 10".	○	
Scaling value storage	Set a temperature value for each channel so that the A/D conversion digital value is 0 > 4000 for each channel of A616TD.	Converted temperature values are scaled between the lower limit value (0) and upper limit value (2000) set in the buffer memory address 30 to 45 and stored. $$\text{Scaling value} = \frac{\text{Converted temperature value - Lower limit value}}{\text{Upper limit value - Lower limit value}} \times 2000$$	—	
Lower/Upper limit value setting	—	Sets for each channel the range of the measured temperature (unit: 0.1℃). As the default, the value in the converted temperature value range of the thermocouple set with the thermocouple selection switch is stored. The lower/upper limit value setting ranges are as follows: 	Thermocouple Type	Default	Lower/Upper Limit Value Setting Range	 |---|---|---| | K	0 to 12000	-2000 to 12000	 | E	0 to 8000	-2000 to 8000	 | J	0 to 7500	-2000 to 7500	 | T	0 to 3500	-2000 to 3500	 | B	8000 to 17000	6000 to 17000	 | R	3000 to 16000	0 to 16000	 | S	3000 to16000	0 to 16000		—	
Error compensation function	This function is provided to compensate for errors between actual and measured temperatures arising from differences in thermocouple accuracy, compensation lead lengths and location conditions of the thermocouples.	—	×	No error compensation function

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

Signal direction: A616TD→PLC CPU		Signal direction: PLC CPU→A616TD		Signal direction: A1S68TD→CPU		Signal direction: CPU→A1S68TD	
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error (A616TD detection)	Y0		X0	WDT error	Y0	
X1	A/D conversion READY	Y1		X1	A/D conversion READY	Y1	
X2	Error	Y2		X2	Error	Y2	
X3	Wire break error detection	Y3		X3	Disconnection detection	Y3	
X4	Digital output value out-of-range detected	Y4		X4	Exceeding measurement range	Y4	
X5	Temperature output value out-of-range detected	Y5		X5		Y5	
X6		Y6	Not used	X6		Y6	
X7		Y7		X7		Y7	Not used
X8		Y8		X8		Y8	
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10	Detected temperature value LED display request signal	X10		Y10	
X11		Y11		X11	Not used	Y11	Set lower/upper limit value update instruction
X12	Not used	Y12		X12		Y12	Error reset
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18	Not used	X18		Y18	
X19		Y19		X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A616TD		Read/Write	Address	A1S68TD	Read/Write
0	Data format selection			0	A/D conversion enable/disable setting	R/W
1	Error code storage			1	Error code	
2	Faulty A60MX□ CONNECT No. storage		R/W	2	Disconnection detection flag	R
3	Thermocouple-type setting error and channel number storage			3	Exceeding measurement range	
4	Current sampling cycle storage			4		
5				5		
6				6	Not used	—
7				7		
8				8		
9	Not used		R	9		
10				10	CH1 Converted temperature value (0.1℃ units)	
11				11	CH2 Converted temperature value (0.1℃ units)	
12				12	CH3 Converted temperature value (0.1℃ units)	
13				13	CH4 Converted temperature value (0.1℃ units)	
14				14	CH5 Converted temperature value (0.1℃ units)	R
15		A616TD		15	CH6 Converted temperature value (0.1℃ units)	
16				16	CH7 Converted temperature value (0.1℃ units)	
17				17	CH8 Converted temperature value (0.1℃ units)	
18				18	Not used	—
19	Conversion enable/ disable designation	Multiplex module	R/W	19		
20				20	CH1 Scaling value	
21				21	CH2 Scaling value	
22				22	CH3 Scaling value	
23				23	CH4 Scaling value	
24	Set data setting request			24	CH5 Scaling value	R
25				25	CH6 Scaling value	
26				26	CH7 Scaling value	
27				27	CH8 Scaling value	
28	Not used		R	28	A/D conversion completion	
29				29	Not used	—
30				30	CH1 Lower limit value (0.1℃ units)	
31				31	CH1 Upper limit value (0.1℃ units)	
32				32	CH2 Lower limit value (0.1℃ units)	
33				33	CH2 Upper limit value (0.1℃ units)	
34				34	CH3 Lower limit value (0.1℃ units)	
35	Disconnection detection enable/disable designation		R/W	35	CH3 Upper limit value (0.1℃ units)	
36				36	CH4 Lower limit value (0.1℃ units)	
37				37	CH4 Upper limit value (0.1℃ units)	R/W
38				38	CH5 Lower limit value (0.1℃ units)	
39				39	CH5 Upper limit value (0.1℃ units)	
40				40	CH6 Lower limit value (0.1℃ units)	
41				41	CH6 Upper limit value (0.1℃ units)	
42				42	CH7 Lower limit value (0.1℃ units)	
43	Not used		R	43	CH7 Upper limit value (0.1℃ units)	
44				44	CH8 Lower limit value (0.1℃ units)	
45				45	CH8 Upper limit value (0.1℃ units)	
46				46		
47				47		
48 to 63	Digital output value temperature setting		R/W	48	Not used	—
64 to 71	Disconnection detection channel number storage			49		

Address	A616TD	Read/Write
72 to 79	Not used	R
80 to 87	No. of the channel where the digital output value is out of range	R/W
88 to 95	Not used	R
96 to 103	No. of the channel where the detected temperature is out of range	R/W
104 to 111	Not used	R
112 to 127	Digital output value of INPUT channel	R
128 to 255	Error compensation settings	R/W
256 to 383	Thermocouple type setting	R/W
384 to 511	Digital output value of MX CH.channel	R
512 to 639	Detected temperature value of MX CH.channel	R

(e) Applicable thermocouples and measured temperature range accuracies

JIS	ANSI	DIN	BS	A616TD					JIS	A1S68TD	
				Measured range no.	1	2	3	4		—	—
				Permitted input voltage range [mV]	-12.5 to 12.5	0 to 25	0 to 50	0 to 100			
B	B	—	PtRh30 -PtRh6	Temperature input range[℃]	100 to 1500	100 to 1800	100 to 1800	100 to 1800	B	Temperature input range[℃]	800 to 1700
				Accuracy at 25℃ [%]	—	± 0.5	—	—		Conversion accuracy at 25 ± 5℃	± 2.5℃
				Temperature drift [%/℃]		± 0.013				Temperature characteristics	± 0.4℃
R	R	—	PtRh13 -Pt	Temperature input range[℃]	0 to 1000	0 to 1700	0 to 1700	0 to 1700	R	Temperature input range[℃]	300 to 1600
				Accuracy at 25℃ [%]	—	± 0.4	—	—		Conversion accuracy at 25 ± 5℃	± 2℃
				Temperature drift [%/℃]		± 0.011				Temperature characteristics	± 0.3℃
S	S	PtRh -Pt	PtRh10 -Pt	Temperature input range[℃]	0 to 1200	0 to 1700	0 to 1700	0 to 1700	S	Temperature input range[℃]	300 to 1600
				Accuracy at 25℃ [%]	—	± 0.4	—	—		Conversion accuracy at 25 ± 5℃	± 2℃
				Temperature drift [%/℃]		± 0.011				Temperature characteristics	± 0.3℃
K	K	NiCr -Ni	NiCr -NiAl	Temperature input range[℃]	-200 to 250	0 to 500	0 to 1000	0 to 1300	K	Temperature input range[℃]	0 to 1200
				Accuracy at 25℃ [%]	± 0.4	± 0.3	± 0.3	± 0.5		Conversion accuracy at 25 ± 5℃	± 0.5℃ or ± 0.25% of measured temperature, whichever is greater.
				Temperature drift [%/℃]	± 0.011	± 0.01	± 0.01	± 0.013		Temperature characteristics	± 0.07℃ or ± 0.02% of measured temperature, whichever is greater.
E	E	—	NiCr -CuNi	Temperature input range[℃]	-200 to 150	0 to 300	0 to 600	0 to 1000	E	Temperature input range[℃]	0 to 800
				Accuracy at 25℃ [%]	± 0.4	± 0.3	± 0.3	± 0.4		Conversion accuracy at 25 ± 5℃	± 0.5℃ or ± 0.25% of measured temperature, whichever is greater.
				Temperature drift [%/℃]	± 0.011	± 0.01	± 0.01	± 0.011		Temperature characteristics	± 0.07℃ or ± 0.02% of measured temperature, whichever is greater.
J	J	—	Fe -CuNi	Temperature input range[℃]	-200 to 200	0 to 400	0 to 800	0 to 1200	J	Temperature input range[℃]	0 to 750
				Accuracy at 25℃ [%]	± 0.4	± 0.3	± 0.3	± 0.4		Conversion accuracy at 25 ± 5℃	± 0.5℃ or ± 0.25% of measured temperature, whichever is greater.
				Temperature drift [%/℃]	± 0.011	± 0.01	± 0.01	± 0.011		Temperature characteristics	± 0.07℃ or ± 0.02% of measured temperature, whichever is greater.

					A616TD					A1S68TD	
JIS	ANSI	DIN	BS	Measured range no.	1	2	3	4	JIS	—	—
				Permitted input voltage range [mV]	-12.5 to 12.5	0 to 25	0 to 50	0 to 100			
T	T	—	Cu -CuNi	Temperature input range[°C]	-200 to 200	0 to 400	0 to 400	0 to 400	T	Temperature input range[°C]	0 to 350
				Accuracy at 25°C [%]	± 0.5	± 0.3	—	—		Conversion accuracy at 25 ± 5°C	± 0.5°C or ± 0.25% of measured temperature, whichever is greater.
				Temperature drift [%/°C]	± 0.013	± 0.01				Temperature characteristics	± 0.07°C or ± 0.02% of measured temperature, whichever is greater.
—	—	Fe -CuNi	—	Temperature input range[°C]	-100 to 200	0 to 400	0 to 800	0 to 900			
				Accuracy at 25°C [%]	—	± 0.3	± 0.3	± 0.5			
				Temperature drift [%/°C]		± 0.01	± 0.01	± 0.013			
—	—	Cu -CuNi	—	Temperature input range[°C]	-100 to 200	0 to 400	0 to 600	0 to 600			
				Accuracy at 25°C [%]	—	± 0.3	± 0.4	—			
				Temperature drift [%/°C]		± 0.01	± 0.011				

(2) Comparisons between A68RD3N and A1S62RD3N

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, ×: Incompatible

Item		A68RD3N	A1S62RD3N	Compatibility	Precautions for replacement
Measuring method		3-wire type		○	
Output (detected temperature value)		16-bit, signed binary (-1800 to 6000: Value to one decimal place× 10) 32-bit, signed binary (-180000 to 600000: Value to three decimal places× 1000)		○	
Applicable platinum RTD		Pt100 (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980), JPt100 (JIS C1604-1981)		○	
Temperature input range	Pt100	-180 to 600℃(27.10 to 313.71 Ω)		○	
	JPt100	-180 to 600℃(25.80 to 317.28 Ω)			
Accuracy		± 1% (accuracy relative to full-scale)		○	
Resolution		0.025℃		○	
Conversion speed		40ms/channel		○	
Analog input points		8 channels/module	2 channels/module	×	The number of channels has decreased. Using multiple A1S62RD3Ns is recommended.
Output current for temperature detection		1mA		○	
Isolation method		Between platinum RTD input and PLC power supply: photocoupler isolation Between platinum RTD input and channels: non-isolated		○	
Dielectric withstand voltage		Between platinum RTD input and PLC power supply: 500VAC for 1 minute		○	
Disconnection detection		Detected for each channel		○	
Occupied I/O points		32 points (I/O assignment: special 32 points)		○	
Connected terminal		38-point terminal block	20-point terminal block	×	External wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.5mm^2	△	
Applicable solderless terminal		V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A		△	
Cables between RD3N and platinum RTD		Conductor resistance between Pt100 and A68RD3N/A1S62RD3N must be 10 Ω or less per wire. All channels have the same specifications.		○	
Internal current consumption (5VDC)		0.94A	0.49A	○	
External dimensions		250(H)× 37.5(W)× 121(D)mm	130(H)×34.5(W)×93.6(D)mm	△	The dimensions are different.
Weight		0.43kg	0.27kg	○	

(b) Function comparison

〇: Compatible, △ : Partial change required, ✕ : Incompatible, ―: Additional function

Item	A68RD3N	A1S62RD3N	Compati-bility	Precautions for replacement
Conversion enable/ disable setting for each channel	Temperature detection is enabled or disabled for each channel. • Conversion enable··· Loads external temperature, and detects the disconnection. • Conversion disable··· Does not load external temperature, and not detect any disconnection.		〇	
Sampling/average processing setting	1) Sampling processing For each sampling time, the detected temperature value is stored in the buffer memory. 2) Time-average processing For each sampling time, the detected temperature value is loaded for the time of the set value (320 to 32000ms), and the average of the total excluding the maximum and minimum values is stored in the buffer memory. 3) Count-average processing For each sampling time, the detected temperature value is loaded for the set number of times (1 to 800 times) and the average of the total excluding the maximum and minimum value is stored in the buffer memory.	1)Sampling processing For each sampling time, the detected temperature value is stored in the buffer memory. 2) Time-average processing For each sampling time, the detected temperature value is loaded for the time of the set value (80 to 32000ms), and the average of the total excluding the maximum and minimum values is stored in the buffer memory. 3) Count-average processing For each sampling time, the detected temperature value is loaded for the set number of times (1 to 800 times) and the average of the total excluding the maximum and minimum value is stored in the buffer memory.	〇	
Storage of detected temperature values	Values rounded to one and three decimal places are stored in the butter memory. • Value rounded to one decimal place (16-bit signed binary) Example: 53.8(℃)→ 538 • Value rounded to three decimal places (32-bit signed binary) Example: 216.025(℃)→ 216025		〇	
Disconnection detection	Disconnection of Pt100 or cable is detected. Disconnection can be detected at each channel and the disconnection-detected flag that corresponds to that channel turns ON when detected.		〇	
Platinum RTD type setting	The type of the platinum RTD to be used is set. There are two kinds of platinum RTDs: 	Platinum RTD type name		Specification
---	---	---
Pt100	1997JIS type	JIS C1604-1997, IEC 751-am2
	1989JIS type	JIS C1604-1989, DIN 43760-1980
JPt100	Old JIS type	JIS C1604-1981			〇	

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

Signal direction: A68RD3N→PLC CPU		Signal direction: PLC CPU→A68RD3N		Signal direction: A1S62RD3N→PLC CPU		Signal direction: PLC CPU→A1S62RD3N	
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error	Y0		X0	WDT error	Y0	
X1	READY	Y1		X1	READY	Y1	
X2	Write data error	Y2		X2	Write data error	Y2	
X3	CH1: Disconnection detected	Y3		X3	CH1: Disconnection detected	Y3	
X4	CH2: Disconnection detected	Y4		X4	CH2: Disconnection detected	Y4	
X5	CH3: Disconnection detected	Y5		X5		Y5	
X6	CH4: Disconnection detected	Y6		X6		Y6	
X7	CH5: Disconnection detected	Y7		X7		Y7	
X8	CH6: Disconnection detected	Y8	Not used	X8		Y8	Not used
X9	CH7: Disconnection detected	Y9		X9		Y9	
XA	CH8: Disconnection detected	YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10		X10	Not used	Y10	
X11		Y11		X11		Y11	
X12		Y12	Error code reset	X12		Y12	Error code reset
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15	Not used	Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	
X19		Y19	Not used	X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address	A68RD3N	Read/Write	Address	A1S62RD3N	Read/Write
0	Conversion enable/disable specification		0	Conversion enable/disable specification	
1	Averaging processing specification		1	Averaging processing specification	R/W
2	CH1 Averaging time/count		2	CH1 Averaging time/count	
3	CH2 Averaging time/count		3	CH2 Averaging time/count	
4	CH3 Averaging time/count	R/W	4		
5	CH4 Averaging time/count		5		
6	CH5 Averaging time/count		6		
7	CH6 Averaging time/count		7	Not used	—
8	CH7 Averaging time/count		8		
9	CH8 Averaging time/count		9		
10	CH1 Detected temperature value (16bit)		10	CH1 Detected temperature value (16bit)	R
11	CH2 Detected temperature value (16bit)		11	CH2 Detected temperature value (16bit)	
12	CH3 Detected temperature value (16bit)		12		
13	CH4 Detected temperature value (16bit)		13		
14	CH5 Detected temperature value (16bit)		14	Not used	—
15	CH6 Detected temperature value (16bit)		15		
16	CH7 Detected temperature value (16bit)		16		
17	CH8 Detected temperature value (16bit)		17		
18	CH1 Detected temperature value (L)		18	CH1 Detected temperature value (L)	R
19	(32bit) (H)		19	(32bit) (H)	
20	CH2 Detected temperature value (L)		20	CH2 Detected temperature value (L)	
21	(32bit) (H)		21	(32bit) (H)	
22	CH3 Detected temperature value (L)	R	22		
23	(32bit) (H)		23		
24	CH4 Detected temperature value (L)		24		
25	(32bit) (H)		25		
26	CH5 Detected temperature value (L)		26		
27	(32bit) (H)		27	Not used	—
28	CH6 Detected temperature value (L)		28		
29	(32bit) (H)		29		
30	CH7 Detected temperature value (L)		30		
31	(32bit) (H)		31		
32	CH8 Detected temperature value (L)		32		
33	(32bit) (H)		33		
34	Write data error code	R/W	34	Write data error code	R/W
35	Conversion completed	R	35	Conversion completed	R
36	Type specification of a platinum RTD	R/W	36	Type specification of a platinum RTD	R/W

(3) Comparisons between A68RD4N and A1S62RD4N

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, ×: Incompatible

Item		A68RD4N	A1S62RD4N	Compati-bility	Precautions for replacement
Measuring method		4-wire type		○	
Output (detected temperature value)		16-bit, signed binary (-1800 to 6000: Value to one decimal place× 10) 32-bit, signed binary (-180000 to 600000: Value to three decimal places× 1000)		○	
Applicable platinum RTD		Pt100 (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980), JPt100 (JIS C1604-1981)		○	
Temperature input range	Pt100	-180 to 600℃(27.10 to 313.71 Ω)		○	
	JPt100	-180 to 600℃(25.80 to 317.28 Ω)			
Accuracy		± 1% (accuracy relative to full-scale)		○	
Resolution		0.025℃		○	
Conversion speed		40ms/channel		○	
Analog input points		8 channels/module	2 channels/module	×	The number of channels decreases. Using multiple A1S62RD4Ns is recommended.
Output current for temperature detection		1mA		○	
Isolation method		Between platinum RTD input and PLC power supply: photocoupler isolation Between platinum RTD input and channels : non-isolated		○	
Dielectric withstand voltage		Between platinum RTD input and PLC power supply: 500VAC for 1 minute		○	
Disconnection detection		Batch-detected on all channels		○	
Occupied I/O points		32 points (I/O assignment: special 32 points)		○	
Connected terminal		38-point terminal block	20-point terminal block	×	External wiring must be changed.
Applicable wire size		0.75 to 2mm^2	0.75 to 1.5mm^2	△	
Applicable solderless terminal		V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A		△	
Cable across RD3N and platinum RTD		Total resistance value of live conductors must be 70 Ω or less.		○	
Internal current consumption (5VDC)		0.41A	0.39A	○	
External dimensions		250(H)× 37.5(W)× 121(D)mm	130(H)× 34.5(W)× 93.6(D)m	△	The dimensions are different.
Weight		0.43kg	0.27kg	○	

(b) Function comparison

○: Compatible, △ : Partial change required, ✕ : Incompatible, ―: Additional function

Item	A68RD4N	A1S62RD4N	Compati-bility	Precautions for replacement
Conversion enable/disable setting for each channel	Temperature detection is enabled or disabled for each channel. • Conversion enable・・・Loads external temperature, and detects the disconnection. • Conversion disable・・・Does not load external temperature, and not detect any disconnection.		○	
Sampling /average processing setting	1) Sampling processing For each sampling time, the detected temperature value is stored in the buffer memory. 2) Time-average processing For each sampling time, the detected temperature value is loaded for the time of the set value (320 to 32000ms) and the average of the total excluding the maximum and minimum values is stored in the buffer memory. 3) Count-average processing For each sampling time, the detected temperature value is loaded for the set number of times (1 to 800 times) and the average of the total excluding the maximum and minimum values is stored in the buffer memory.	1) Sampling processing For each sampling time, the detected temperature value is stored in the buffer memory. 2) Time-average processing For each sampling time, the detected temperature value is loaded for the time of the set value (80 to 32000ms) and the average of the total excluding the maximum and minimum values is stored in the buffer memory. 3) Count-average processing For each sampling time, the detected temperature value is loaded for the set number of times (1 to 800 times) and the average value of the total exculding the maximum and minimum value is stored in the buffer memory.	○	
Storage of detected temperature values	Values rounded to one and three decimal places are stored in the buffer memory. • Value rounded to one decimal place (16-bit signed binary) Example: 53.8(℃)→ 538 • Value rounded three decimal places (32-bit signed binary) Example: 216.025(℃)→216025		○	
Disconnection detection	Disconnection of Pt100 or cable is detected. If either channel disconnection is detected, the ∑ disconnection-detected flag turns ON.		○	
Platinum RTD type setting	The type of the platinum RTD to be used is set. There are two kinds of platinum RTDs: | Platinum RTD type name		Specification | |---|---|---| | Pt100 | 1997JIS type | JIS C1604-1997, IEC 751-am2 | | | 1989JIS type | JIS C1604-1989, DIN 43760-1980 | | JPt100 | Old JIS type | JIS C1604-1981 |		○	

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

Signal direction: A68RD4N→PLC CPU		Signal direction: PLC CPU→A68RD4N		Signal direction: A1S62RD4N→PLC CPU		Signal direction: PLC CPU→A1S62RD4N	
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	WDT error	Y0		X0	WDT error	Y0	
X1	READY	Y1		X1	READY	Y1	
X2	Write data error	Y2		X2	Write data error	Y2	
X3	∑ disconnection detection (CH1 to CH8)	Y3		X3	∑ disconnection detection (CH1, CH2)	Y3	
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8	Not used	X8		Y8	Not used
X9		Y9		X9		Y9	
XA		YA		XA		YA	
XB		YB		XB		YB	
XC		YC		XC		YC	
XD		YD		XD		YD	
XE		YE		XE		YE	
XF		YF		XF		YF	
X10		Y10		X10		Y10	
X11		Y11		X11		Y11	
X12	Not used	Y12	Error code reset	X12	Not used	Y12	Error code reset
X13		Y13		X13		Y13	
X14		Y14		X14		Y14	
X15		Y15		X15		Y15	
X16		Y16		X16		Y16	
X17		Y17		X17		Y17	
X18		Y18		X18		Y18	
X19		Y19	Not used	X19		Y19	Not used
X1A		Y1A		X1A		Y1A	
X1B		Y1B		X1B		Y1B	
X1C		Y1C		X1C		Y1C	
X1D		Y1D		X1D		Y1D	
X1E		Y1E		X1E		Y1E	
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.
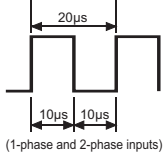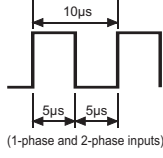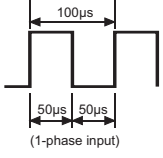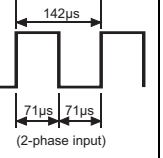
Address	A68RD4N	Read/Write	Address	A1S62RD4N	Read/Write
0	Conversion enable/disable specification		0	Conversion enable/disable specification	
1	Averaging processing specification		1	Averaging processing specification	R/W
2	CH1 Averaging time/count		2	CH1 Averaging time/count	
3	CH2 Averaging time/count		3	CH2 Averaging time/count	
4	CH3 Averaging time/count	R/W	4		
5	CH4 Averaging time/count		5		
6	CH5 Averaging time/count		6	Not used	—
7	CH6 Averaging time/count		7		
8	CH7 Averaging time/count		8		
9	CH8 Averaging time/count		9		
10	CH1 Detected temperature value (16bit)		10	CH1 Detected temperature value (16bit)	R
11	CH2 Detected temperature value (16bit)		11	CH2 Detected temperature value (16bit)	
12	CH3 Detected temperature value (16bit)		12		
13	CH4 Detected temperature value (16bit)		13		
14	CH5 Detected temperature value (16bit)		14	Not used	—
15	CH6 Detected temperature value (16bit)		15		
16	CH7 Detected temperature value (16bit)		16		
17	CH8 Detected temperature value (16bit)		17		
18	CH1 Detected temperature value (L)		18	CH1 Detected temperature value (L)	R
19	(32bit) (H)		19	(32bit) (H)	
20	CH2 Detected temperature value (L)		20	CH2 Detected temperature value (L)	
21	(32bit) (H)		21	(32bit) (H)	
22	CH3 Detected temperature value (L)	R	22		
23	(32bit) (H)		23		
24	CH4 Detected temperature value (L)		24		
25	(32bit) (H)		25		
26	CH5 Detected temperature value (L)		26		
27	(32bit) (H)		27		
28	CH6 Detected temperature value (L)		28	Not used	—
29	(32bit) (H)		29		
30	CH7 Detected temperature value (L)		30		
31	(32bit) (H)		31		
32	CH8 Detected temperature value (L)		32		
33	(32bit) (H)		33		
34	Write data error code	R/W	36	Write data error code	R/W
35	Conversion completed	R	37	Conversion completed	R
36	Type specification of a platinum RTD	R/W	39	Type specification of a platinum RTD	R/W

10.2.4 High-speed counter module comparison

(1) Comparisons between AD61 and A1SD62

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, ✕ : Incompatible, —:Additional function

Item			AD61	A1SD62		Compatibility	Precautions for replacement
Occupied I/O points			32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)		○	
Number of channels			2	2		○	
Counting speed switch setting			—	100k	10k	—	
Performance specifications per channel	Count input signal	Phase	1-phase or 2-phase input	1-phase or 2-phase input		○	
		Signal level (φA, φB)	5VDC 12VDC 24VDC } 2 to 5mA	5VDC 12VDC 24VDC } 2 to 5mA			
	Counter	Counting speed (Max.)*	1-phase input 50kPPS	100kPPS	10kPPS	○	
			2-phase input 50kPPS	100kPPS	7kPPS		
		Counting range	Binary format 24-bit binary 0 to 16,777,215 (Dec.)	24-bit binary 0 to 16,777,215		○	
		Type	UP/DOWN preset counter + Ring counter function	UP/DOWN preset counter + Ring counter function		○	
		Minimum count pulse width	(1-phase and 2-phase inputs)	(1-phase and 2-phase inputs) (1-phase input) (2-phase input)		○	
	Magnitude comparison between CPU and AD61	Comparison range	Binary format (Bin.) 24 bits	24-bit binary		○	
		Comparison result	Set value < Count value Set value = Count value Set value > Count value	Set value < Count value Set value = Count value Set value > Count value			
	External input	Preset	12/24VDC 3/6mA 5VDC 5mA	5/12/24VDC 2 to 5mA		○	
		Count disable	12/24VDC 3/6mA 5VDC 5mA	—		✕	Enabled by function start terminal.
		Function start	—	5/12/24VDC 2 to 5mA		—	
	External output	Coincidence output	Transistor (open collector) output 12/24VDC 0.5A	Transistor (sink type) output 12/24VDC 0.5A/point 2A/common		○	
Internal current consumption (5VDC)			0.3A	0.1A		○	
External dimensions			250 (H) × 37.5 (W) × 121 (D) mm	130 (H) × 34.5 (W) × 93.6 (D) mm		△	The dimensions are different.
Weight			0.5kg	0.25kg		○	

(b) Function comparison

○: Compatible, △ : Partial change required, ✕ : Incompatible, —: Additional function

Item	AD61	A1SD62	Compati-bility	Precautions for replacement
Preset function	Changes the present counter value to a given value (initial value). The latch function is not provided for the AD61 memory. When the power is turned OFF, or when the CPU is reset, the AD61 memories (counter value, present value, set value and preset value) are initialized. Storing the present counter value into the data register of the CPU in continuous operation allows counting from the stored value in the next operation.	Changes the present counter value to a given value, which is a preset value. This function can be used to start the pulse count from the set value. There are two methods for the function, "preset in sequence program" and "preset by external control signal (applying voltage to external terminal)".	○	
Disable function	Turning ON the count enable signal shown in the PLC I/O signal assignment starts counting on the AD61. (CH1=Y14, CH2=Y1B). When voltage is applied to the DIS (disable) terminal of the external input terminal block, the AD61 stops counting. Therefore, counting can be started and stopped by external input regardless of the scan time.	Stops counting while the count enable command is OFF.	○	
Ring counter function	Automatically presets the value when the counter value and the set value are equal with the ring counter setting pin set to ON on the AD61 board. Used for cyclic control such as constant-rate feeding.	Repeats counting between the preset value and the ring counter value with the ring counter command. Used for control such as constant-rate feeding.	○	
Latch counter function	—	Latches the present value at the time a signal is input.	—	
Sampling counter function	—	Counts the pulse input at the sampling time set. The setting unit of the sampling time is 10ms, and the accuracy is less than 1 count.	—	
Periodic pulse counter function	—	Allows storing the present value and the previous value in the corresponding periodic pulse counter value areas at the specified intervals. The setting unit is 10ms, and the accuracy is less than 1 count.	—	
Coincidence output function	Outputs an ON/OFF signal, comparing the set value with the present value of the counter.	Outputs an signal when the specified counter value is matched with the present value of the counter as a result of comparison. Tow-point setting is available.	○	2 points can be set.

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

AD61				A1SD62			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	CH1 Counter value greater	Y0		X0	CH1 Counter value greater (point No.1)	Y0	
X1	CH1 Counter value matched	Y1		X1	CH1 Counter value matched (point No.1)	Y1	
X2	CH1 Counter value smaller	Y2		X2	CH1 Counter value smaller (point No.1)	Y2	
X3	CH1 External preset request detection	Y3		X3	CH1 External preset request detection	Y3	
X4	CH2 Counter value greater	Y4		X4	CH2 Counter value greater (point No.1)	Y4	
X5	CH2 Counter value matched	Y5		X5	CH2 Counter value matched (point No.1)	Y5	
X6	CH2 Counter value smaller	Y6		X6	CH2 Counter value smaller (point No.1)	Y6	
X7	CH2 External preset request detection	Y7	Not used	X7	CH2 External preset request detection	Y7	Not used
X8		Y8		X8	CH1 Counter value greater (point No.2)	Y8	
X9		Y9		X9	CH1 Counter value matched (point No.2)	Y9	
XA		YA		XA	CH1 Counter value smaller (point No.2)	YA	
XB		YB		XB	CH2 Counter value greater (point No.2)	YB	
XC		YC		XC	CH2 Counter value matched (point No.2)	YC	
XD		YD		XD	CH2 Counter value smaller (point No.2)	YD	
XE		YE		XE	Fuse/External power cutoff detection	YE	
XF		YF		XF		YF	
X10		Y10	CH1 Coincidence signal reset command	X10		Y10	CH1 Coincidence signal reset command
X11		Y11	CH1 Preset command	X11		Y11	CH1 Preset command
X12		Y12	CH1 Coincidence signal output enable	X12		Y12	CH1 Coincidence signal output enable command
X13		Y13	CH1 Down count command	X13		Y13	CH1 Down count command
X14	Not used	Y14	CH1 Count enable	X14		Y14	CH1 Count enable command
X15		Y15	CH1 Present value read request	X15		Y15	CH1 Count value read request
X16		Y16	CH1 External preset detection reset command	X16		Y16	CH1 Counter function selection start command
X17		Y17	CH2 Coincidence signal reset command	X17	Not used	Y17	CH2 Coincidence signal reset command
X18		Y18	CH2 Preset command	X18		Y18	CH2 Preset command
X19		Y19	CH2 Coincidence signal output enable	X19		Y19	CH2 Coincidence signal output enable command
X1A		Y1A	CH2 Down count command	X1A		Y1A	CH2 Down count command
X1B		Y1B	CH2 Count enable	X1B		Y1B	CH2 Count enable command
X1C		Y1C	CH2 Present value read request	X1C		Y1C	CH2 Count value read request
X1D		Y1D	CH2 External preset detection reset command	X1D		Y1D	CH2 Counter function selection start command
X1E		Y1E	Not used	X1E		Y1E	Not used
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address		AD61		Read/Write	Address		A1SD62		Read/Write
CH1	CH2	Name		Read/Write	CH1	CH2	Name		Read/Write
1	33	Preset value write (Lower and middle)	W		1	33	Preset value setting	(L)	R/W
(2)	(34)	Preset value write (Upper)			2	34		(H)	
3	35	Mode register	R/W		3	35	Pulse input mode setting		
4	36	Present value read (Lower and middle)	R		4	36	Present value	(L)	R
(5)	(37)	Present value read (Upper)			5	37		(H)	
6	38	Set value read/write (Lower and middle)	R/W		6	38	Coincident output point setting No.1	(L)	R/W
(7)	(39)	Set value read/write (Upper)			7	39		(H)	
					8	40	Counter function selection setting		
					9	41	Sampling/Cycle setting 1 to 65535 [10ms increments]		
					10	42	External preset detection reset command		W
					11	43	Point No.2 coincidence signal reset command		
					12	44	Coincident output point setting No.2	(L)	R/W
					13	45		(H)	
					14	46	Latch count value	(L)	R
					15	47		(H)	
					16	48	Sampling count value	(L)	
					17	49		(H)	
					18	50	Periodic pulse counter previous value	(L)	
					19	51		(H)	
					20	52	Periodic pulse counter present value	(L)	
					21	53		(H)	
					22		Sampling/Cycle counter (for both CH1 and CH2)		

Address in parentheses in the above table indicates that of the upper 8 bits in the 24-bit data.

(2) Comparisons between AD61S1 and A1SD62

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, × : Incompatible

	Item		AD61S1	A1SD62		Compati-bility	Precautions for replacement
	Occupied I/O points		32 points (I/O assignment: special 32 points)	32 points (I/O assignment: special 32 points)		○	
	Number of channels		2	2		○	
	Counting speed switch setting		—	100k	10k	—	
Performance specifications per channel	Count input signal	Phase	1-phase or 2-phase input	1-phase or 2-phase input		○	
		Signal level (ϕA, ϕB)	5VDC 12VDC 24VDC } 2 to 5mA	5VDC 12VDC 24VDC } 2 to 5mA			
	Counter	Counting speed (Max.)*	1-phase input: 10kPPS	100kPPS	10kPPS	○	
			2-phase input: 7kPPS	100kPPS	7kPPS		
		Counting range	Binary format 24-bit binary 0 to 16,777,215 (Dec.)	24-bit binary 0 to 16,777,215		○	
		Type	UP/DOWN preset counter + Ring counter function	UP/DOWN preset counter + Ring counter function		○	
		Minimum count pulse width (Input rise and fall time is 2.5µs or less for A1SD62 and 5µs for others. Duty ratio: 50%)	100µs / 50µs 50µs (1-phase input) / 142µs / 71µs 71µs (2-phase input)	10µs / 5µs 5µs (1-phase and 2-phase inputs) / 100µs / 50µs 50µs (1-phase input) / 142µs / 71µs 71µs (2-phase input)		○	
	Magnitude comparison between CPU and AD61	Comparison range	Binary format (Bin.) 24 bits	24-bit binary		○	
		Comparison result	Set value < Count value Set value = Count value Set value > Count value	Set value < Count value Set value = Count value Set value > Count value			
	External input	Preset	12/24VDC 3/6mA 5VDC 5mA	5/12/24VDC 2 to 5mA		○	
		Count disable	12/24VDC 3/6mA 5VDC 5mA	—		×	Enabled by function start terminal.
		Function start	—	5/12/24VDC 2 to 5mA		—	
	External output	Coincidence output	Transistor (open collector) output 12/24VDC 0.5A	Transistor (sink type) output 12/24VDC 0.5A/point 2A/common		○	
	Internal current consumption (5VDC)		0.3A	0.1A		○	
	External dimensions		250 (H) × 37.5 (W) × 121 (D) mm	130 (H) × 34.5 (W) × 93.6 (D) mm		△	The dimensions are different.
	Weight		0.5kg	0.25kg		○	

(b) Function comparison

○: Compatible, △ : Partial change required, ×: Incompatible, —: Additional function

Item	AD61S1	A1SD62	Compatibility	Precautions for replacement
Preset function	Changes the present counter value to a given value (initial value). The latch function is not provided for the AD61 memory. When the power is turned OFF, or when the CPU is reset, the AD61 memories (counter value, present value, set value and preset value) are initialized. Storing the present counter value into the data register of the CPU in continuous operation allows counting from the stored value in the next operation.	Changes the present counter value to a given value, which is a preset value. This function can be used to start the pulse count from the set value. There are two methods for the function, "preset in sequence program" and "preset by external control signal (applying voltage to external terminal)".	○	
Disable function	Turning ON the count enable signal shown in the PLC I/O signal assignment starts counting on the AD61. (CH1 =Y14, CH2=Y1B) When voltage is applied to the DIS (disable) terminal of the external input terminal block, the AD61 stops counting. Therefore, counting can be started and stopped by external input regardless of the scan time.	Stops counting while the count enable command is OFF.	○	
Ring counter function	Automatically presets the value when the counter value and the set value are equal with the ring counter setting pin set to ON on the AD61 board. Used for cyclic control such as constant-rate feeding.	Repeats counting between the preset value and the ring counter value with the ring counter command. Used for control such as constant-rate feeding.	○	
Ring counter function	—	Latches the present value at the time a signal is input.	—	
Sampling counter function	—	Counts the pulse input at the sampling time set.The setting unit of the sampling time is 10ms, and the accuracy is less than 1 count.	—	
Periodicpulse counter function	—	Allows storing the present value and the previous value in the corresponding periodic pulse counter value areas at the specified intervals. The setting unit is 10ms, and the accuracy is less than 1 count.	—	
Coincidence output function	Outputs an ON/OFF signal, comparing the set value with the present value of the counter.	Outputs an signal when the specified counter value is matched with the present value of the counter as a result of comparison. Two-point setting is available.	○	2 points can be set.

(c) Comparison of I/O signals for PLC CPU

Modifying sequence program is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

AD61S1				A1SD62			
Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X0	CH1 Counter value greater	Y0		X0	CH1 Counter value greater (point No.1)	Y0	
X1	CH1 Counter value matched	Y1		X1	CH1 Counter value matched (point No.1)	Y1	
X2	CH1 Counter value smaller	Y2		X2	CH1 Counter value smaller (point No.1)	Y2	
X3	CH1 External preset request detection	Y3		X3	CH1 External preset request detection	Y3	
X4	CH2 Counter value greater	Y4		X4	CH2 Counter value greater (point No.1)	Y4	
X5	CH2 Counter value matched	Y5		X5	CH2 Counter value matched (point No.1)	Y5	
X6	CH2 Counter value smaller	Y6	Not used	X6	CH2 Counter value smaller (point No.1)	Y6	Not used
X7	CH2 External preset request detection	Y7		X7	CH2 External preset request detection	Y7	
X8		Y8		X8	CH1 Counter value greater (point No.2)	Y8	
X9		Y9		X9	CH1 Counter value matched (point No.2)	Y9	
XA		YA		XA	CH1 Counter value smaller (point No.2)	YA	
XB		YB		XB	CH2 Counter value greater (point No.2)	YB	
XC		YC		XC	CH2 Counter value matched (point No.2)	YC	
XD		YD		XD	CH2 Counter value smaller (point No.2)	YD	
XE		YE		XE	Fuse/External power cutoff detection flag	YE	
XF		YF		XF		YF	
X10		Y10	CH1 Coincidence signal reset command	X10		Y10	CH1 Coincidence signal reset command
X11		Y11	CH1 Preset command	X11		Y11	CH1 Preset command
X12		Y12	CH1 Coincidence signal output enable	X12		Y12	CH1 Coincidence signal output enable command
X13		Y13	CH1 Down count command	X13		Y13	CH1 Down count command
X14	Not used	Y14	CH1 Count enable	X14		Y14	CH1 Count enable command
X15		Y15	CH1 Present value read request	X15		Y15	CH1 Count value read request
X16		Y16	CH1 External preset detection reset command	X16		Y16	CH1 Counter function selection start command
X17		Y17	CH2 Coincidence signal reset command	X17	Not used	Y17	CH2 Coincidence signal reset command
X18		Y18	CH2 Preset command	X18		Y18	CH2 Preset command
X19		Y19	CH2 Coincidence signal output enable	X19		Y19	CH2 Coincidence signal output enable command
X1A		Y1A	CH2 Down count command	X1A		Y1A	CH2 Down count command
X1B		Y1B	CH2 Count enable	X1B		Y1B	CH2 Count enable command
X1C		Y1C	CH2 Present value read request	X1C		Y1C	CH2 Count value read request
X1D		Y1D	CH2 External preset detection reset command	X1D		Y1D	CH2 Counter function selection start command
X1E		Y1E	Not used	X1E		Y1E	Not used
X1F		Y1F		X1F		Y1F	

(d) Buffer memory address comparison

Modifying sequence programs is required as the assignment of buffer memory differs.
For details of the buffer memory and sequence programs, refer to the user's manual.

Address		AD61S1		Address		A1SD62	
CH1	CH2	Name	Read/Write	CH1	CH2	Name		Read/Write
1	33	Preset value write (Lower and middle)	W	1	33	Preset value setting	(L)	R/W
(2)	(34)	Preset value write (Upper)		2	34		(H)	
3	35	Mode register	R/W	3	35	Pulse input mode setting		
4	36	Present value read (Lower and middle)	R	4	36	Present value	(L)	R
(5)	(37)	Present value read (Upper)		5	37		(H)	
6	38	Set value read/write (Lower and middle)	R/W	6	38	Coincident output point setting No.1	(L)	R/W
(7)	(39)	Set value read/write (Upper)		7	39		(H)	
				8	40	Counter function selection setting		
				9	41	Sampling/Cycle setting 1 to 65535 [10ms increments]		
				10	42	External preset detection reset command		W
				11	43	Point No.2 coincidence signal reset command		
				12	44	Coincident output point setting No.2	(L)	R/W
				13	45		(H)	
				14	46	Latch count value	(L)	R
				15	47		(H)	
				16	48	Sampling count value	(L)	
				17	49		(H)	
				18	50	Periodic pulse counter previous value	(L)	
				19	51		(H)	
				20	52	Periodic pulse count present value	(L)	
				21	53		(H)	
				22		Sampling/Cycle counter (for both CH1 and CH2)		

Address in parentheses in the above table indicates that of the upper 8 bits in the 24-bit data.

10.2.5 Position detection module comparison

(1) Comparisons between A62LS-S5 and A1S62LS

(a) Performance specifications comparison

○: Compatible, △ : Partial change required, × : Incompatible

Item		Specifications A62LS-S5	Specifications A1S62LS	Compatibility	Precautions for replacement
Number of detectable axes		1		○	
Position detection method		Absolute position detection		○	
Resolution		Multiturn type: [4096 × 32 turns] to [409.6 × 320 turns] Linear type: 0.0039062mm/256mm to 0.015625mm/1024mm	[4096 × 32 turns] to [409.6 × 320 turns]	○	
Limit switch output function	Number of programs	9 — Program No.0 (Data is not held when power is OFF.) / Program No.1 to 8 (Data is held when power is OFF.)	9 — Program No.0 (Data is not held when power is OFF.) / Program No.1 to 8 (Data is held when power is OFF.)	○	
	Number of multi-dogs (dog/CH.)	10		○	
	Number of output channels (CH.)	For limit switch output function only: 16/program For limit switch output and positioning functions : 16/program		○	
	Data setting method	(see table below, A62LS-S5)	(see table below, A1S62LS)	△	The setting cannot be made by teaching.
Positioning function	Control method	Unidirectional positioning		○	
	Target position setting method	1-point setting prior to positioning operation (sequence program setting, or key input setting at A62LS-S5)	1-point setting prior to positioning operation (sequence program setting, or key input setting at VS-T62)	○	
	Max. number of positioning points	1 point		○	
	Number of registered positioning pattern data	2		○	
	Number of positioning signal output channels	8 channels		○	
	Data setting method	(see table below, A62LS-S5)	(see table below, A1S62LS)	○	

Limit switch output function — Data setting method (A62LS-S5):

Setting Value / Setting Method	Function Setting Parameter	Multi-Dog	Program No.	Limit SW Output Enabled
Sequence program	○	○	○	○
Key input at VS-62	○	○	○ (Possible only in PROGRAM mode)	
Teaching		○ (Possible only in PROGRAM mode)		

Limit switch output function — Data setting method (A1S62LS):

Setting Value / Setting Method	Function Setting Parameter	Multi-Dog	Program No.	Limit SW Output Enabled
Sequence program	○	○	○	○
Key input at VS-T62	○	○	○ (Possible only in PROGRAM mode)	

Positioning function — Data setting method (A62LS-S5):

Setting Value / Setting Method	Initial Setting/Parameter	Target Stop Position
Sequence program	○	○
Key input setting at A62LS-S5	○	○ (Possible only in PROGRAM mode)

Positioning function — Data setting method (A1S62LS):

Setting Value / Setting Method	Initial Setting/Parameter	Target Stop Position
Sequence program	○	○
Key input at VS-T62	○	○ (Possible only in PROGRAM mode)

◯: Compatible, △ : Partial change required, ✕ : Incompatible

Item		Specifications		Compati-bility	Precautions for replacement
		A62LS-S5	**A1S62LS**		
Minimum position setting unit		0.00001		◯	
Current position value setting function		Current position value setting, Current position value preset setting		◯	
JOG operation function		JOG operation executed by JOG FWD/RVS signal inputs.		◯	
Sampling time		1 ms		◯	
Response time	Limit SW output signal & positioning output signal	2 ms		◯	
	Current value output			◯	
Gate time (ms)	Speed output	Depends on the parameter setting, 4, 8, 16, 32 or 64		◯	
	Rotation speed output	117		◯	
Number of occupied I/O points		48 points (I/O assignment: empty 16 + special 32 points)	32 points (I/O assignment: special 32 points)	△	Change the start I/O No. by PLC parameter.
Internal current consumption (5VDC)		1.5A	0.55A	◯	
External dimensions		250(H)× 75(W)× 121(D)mm	130(H)× 34(W)× 93(D)mm	△	The dimensions are different.
Weight		1.1kg	0.5kg	◯	

(b) External input/output specifications comparison

1) Input specifications

○: Compatible, △ : Partial change required, ✕ : Incompatible

Item		A62LS-S5	A1S62LS	Compati-bility	Precautions for replacement
Number of input points		Current position value preset input: 2 points		○	
Isolation method		Photo-coupler		○	
Rated input voltage		12/24VDC		○	
Rated input current		4/10 mA		○	
Operating input voltage range		10.2 to 30 VDC		○	
ON voltage		10 VDC or more		○	
OFF voltage		4VDC or more		○	
Response time	OFF→ON	0.04 ms (At input voltage of 24V)		○	
	ON→OFF	0.2 ms (At input voltage of 24V)		○	
Common connections		1 common for 2 points (common terminal: TB19)	1 common for 2 points (common terminal: B1, B2)	✕	Wiring must be changed.
External cable connection		20-point terminal block connector (M3×6 screws)	24-pin connector		
Applicable wire size		0.75 to 2mm^2	0.3mm^2		

2) Output specifications

○: Compatible, △ : Partial change required, ✕ : Incompatible

Item		A62LS-S5		A1S62LS		Compati-bility	Precautions for replacement
Number of output points		For limit SW output function only	16 points	For current value detection function only	Not output	○	
				For limit SW output function only	16 points	○	
		For limit SW output and positioning functions	Limit SW output: 8 points Positioning signal output: 8 points	For limit SW output and positioning functions	Limit SW output: 8 points Positioning signal output: 8 points	○	
Isolation method		Photo-coupler				○	
Rated load voltage		12/24VDC				○	
Operating load voltage range		10.2 to 30VDC				○	
Max. load current		100mA				○	
Max. inrush current		0.4 A				○	
Current leakage when OFF		0.1mA or less				○	
Max. voltage drop when ON		0.5V (at 100 mA)		1.0V (at 50 mA)		△	Check the external device specifications as the external output specifications differ.
Response time	OFF→ON	0.04ms (when load current is 100 mA)		1ms (when load current is 50 mA)			
	ON→OFF	0.2ms (when load current is 100 mA)		1ms (when load current is 50 mA)			
Common connections		1 common for 16 points (common terminal: TB20)		1 common for 16 points (common terminal: A1, A2)		✕	Wiring must be changed.
External cable connection		20-point terminal block connector (M3×6 screws)		24-pin connector			
Applicable wire size		0.75 to 2mm^2		0.3mm^2			

(c) Comparison of I/O signals for PLC CPU

Modifying sequence programs is required as the I/O signals differ.
For details of the I/O signals and sequence programs, refer to the user's manual.

A62LS-S5				A1S62LS					
Device NO.	**Signal name**	**Device NO.**	**Signal name**	**Device NO.**	**Signal name**			**Device NO.**	**Signal name**
X0 to XF	Not used	Y0 to YF	Not used	X0	WDT error			Y0 to YF	Not used
				X1	A1S62LS operation status				
				X2	'Upper limit overtravel' detection				
				X3	'Lower limit overtravel' detection				
				X4	Sensor error detection				
				X5	'Excessive correction amount' detection				
				X6	'Excessive current position change' detection				
				X7	Error detection				
				X8	For limit SW output function only	Channel 0	Channel 8 (FWD or FWD/low-speed)		
				X9		Channel 1	Channel 9 (RVS or RVS/low-speed)		
				XA		Channel 2	Channel 10 (High-speed)		
				XB		Channel 3	Channel 11 (Low- or medium-speed)		
				XC		Channel 4	Channel 12 (Brake release)		
				XD		Channel 5	Channel 13 (In-position)		
				XE		Channel 6	Channel 14 (Positioning in progress)		
				XF		Channel 7	Channel 15 (Operation error)		

(Note: For X8 to XF — "For limit SW output function only" applies to the Channel 0–7 column; "For joint use of limit SW output and positioning functions" applies to the Channel 8–15 column.)

A62LS-S5					A1S62LS			
Device NO.	Signal name			Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name

Device NO.	Signal name			Device NO.	Signal name	Device NO.	Signal name	Device NO.	Signal name
X10	WDT error			Y10		X10 to X1F	Not used	Y10	PLC ready
X11	A62LS-S5 operation status			Y11				Y11	Positioning START (leading edge detection)
X12	"Upper limit overtravel" detection			Y12				Y12	Positioning STOP (leading edge detection)
X13	"Lower limit overtravel" detection			Y13				Y13	FWD (forward) JOG (operation occurs during ON)
X14	Sensor error detection			Y14				Y14	RVS (reverse) JOG (operation occurs during ON)
X15	"Excessive correction amount" detection			Y15				Y15	Limit SW output enabled
X16	"Excessive current position change" detection			Y16				Y16	Error reset
X17	Error detection			Y17				Y17	Current position preset 1 disabled Current position preset command (leading edge detection)
X18	For limit SW output function only	Channel 0	For joint use of limit SW output and positioning functions	Channel 8 (FWD or FWD/low-speed)	Y18	Not used			Y18	Current position preset 2 disabled
X19		Channel 1		Channel 9 (RVS or RVS/low-speed)	Y19				Y19	Mode lock
X1A		Channel 2		Channel 10 (High-speed)	Y1A				Y1A to Y1F	Not used
X1B		Channel 3		Channel 11 (Low- or medium-speed)	Y1B					
X1C		Channel 4		Channel 12 (Brake release)	Y1C					
X1D		Channel 5		Channel 13 (In-position)	Y1D					
X1E		Channel 6		Channel 14 (Positioning in progress)	Y1E					
X1F		Channel 7		Channel 15 (Operation error)	Y1F					

A62LS-S5			
Device NO.	**Signal name**	**Device NO.**	**Signal name**
X20 to X2F	Not used	Y20	PLC ready
		Y21	Positioning START (leading edge detection)
		Y22	Positioning STOP (leading edge detection)
		Y23	FWD (forward) JOG (operation occurs during ON)
		Y24	RVS (reverse) JOG (operation occurs during ON)
		Y25	Limit SW output enabled
		Y26	Error reset
		Y27	Current position preset 1 disabled Current position preset command (leading edge detection)
		Y28	Current position preset 2 disabled
		Y29 to Y2F	Not used

(d) Buffer memory address comparison

No special differences are identified.

10.2.6 Positioning module comparison

(1) Comparisons between AD70 and A1SD70

(a) Performance specifications comparison (Compatible for other than items shown in the following list.)

○: Compatible, △: Partial change required, ×: Incompatible

Item		AD70	A1SD70	Compati-bility	Precautions for replacement
Number of I/O points		32 points (I/O assignment: 32 special-purpose points)	48 points (I/O assignment: 16 empty points + 32 special-purpose points)	△	Change the start I/O No. by PLC parameter.[*1]
Number of I/O slots		1 slot occupied	2 slots occupied	×	Since 1 more slot is occupied, the number of base slots must be reviewed.[*1]
Connector for external connection	For control signal connection	9-pin connector	9-pin connector	○	
	For drive module connection	15-pin connector	15-pin connector	○	
External power supply	Voltage	+15VDC/-15VDC	+15VDC/-15VDC	○	
	Current	+15VDC···0.2A/-15VDC···0.02A	+15VDC···0.2A/-15VDC···0.02A	○	
	Terminal screw size	M4 screw	M3.5 screw	×	Wiring must be changed.
Internal current consumption		5VDC 0.3A	5VDC 0.3A	○	
External dimentions		250(H) × 37.5(W) × 119(D) (mm)	130(H) × 69.5(W) × 93.6(D) (mm)	△	The dimensions are different.
Weight		0.5kg	0.4kg	○	

*1 Since 2 slots are occupied for A1SD70, the device NO. differs from that of AD70. Therefore, the existing program must be modified.
In the parameter I/O assignment of GX Developer, setting the first slot of A1SD70 to "0 empty point" enables reuse of the existing program. I/O assignment setting is recommended.
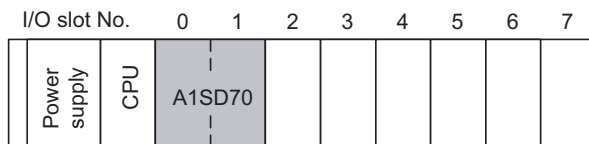
I/O assignment for AD70

When AD70 is set to I/O slot No.0 of main base

I/O slot No.	0	1	2	3	4	5	6	7
Power supply / CPU / AD70								
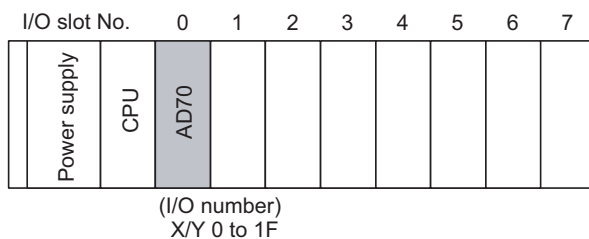
(I/O number)
X/Y 0 to 1F

I/O assignment for A1SD70

When A1SD70 is set to I/O slot No.0 and 1 of main base

I/O slot No.	0	1	2	3	4	5	6	7
Power supply / CPU / A1SD70								

(I/O number)

	Slot 0	Slot 1
Without I/O assignment	16 points (X/Y 0 to F)	32 points (X/Y 10 to 2F)
With I/O assignment	0 point (-)	32 points (X/Y 0 to 1F)

(b) Function comparison

No special differences are identified.

(c) Comparison of I/O signals for PLC CPU

Compatibility is supported in the setting marked.[1]

| AD70				A1SD70			
Device NO.	Signal	Device NO.	Signal	Device NO.	Signal	Device NO.	Signal
X0	WDT error, H/W error	Y0	Not used	X0 to XF	Not used	Y0	Not used
X1	AD70 ready	Y1				Y1	
X2	Zero return request	Y2				Y2	
X3	Zero return completion	Y3				Y3	
X4	BUSY	Y4				Y4	
X5	Positioning completion	Y5				Y5	
X6	In-position	Y6				Y6	
X7	Servo error excessive	Y7				Y7	
X8	Error detection	Y8				Y8	
X9	Overflow	Y9				Y9	
XA	Underflow	YA				YA	
XB	Servo ready	YB				YB	
XC	Near-zero point dog	YC				YC	
XD	Stop (external stop signal)	YD				YD	
XE	Upper limit LS	YE				YE	
XF	Lower limit LS	YF				YF	
X10 to X1C	Not used	Y10	Zero return start	X10	WDT error, H/W error	Y10	Not used
		Y11	Absolute positioning start	X11	A1SD70 ready	Y11	
		Y12	Forward start (in the incremental mode and velocity/position control switchover mode)	X12	Zero return request	Y12	
		Y13	Reverse start (in the incremental mode and velocity/position control switchover mode)	X13	Zero return completion	Y13	
		Y14	Forward JOG start	X14	BUSY	Y14	
		Y15	Reverse JOG start	X15	Positioning completion	Y15	
		Y16	Velocity/position mode re-start	X16	In-position	Y16	
		Y17	Stop	X17	Servo error excessive	Y17	
		Y18	Error reset	X18	Error detection	Y18	
		Y19	Overflow reset	X19	Overflow	Y19	
		Y1A	Underflow reset	X1A	Underflow	Y1A	
		Y1B	Not used	X1B	Servo ready	Y1B	
		Y1C	Velocity/position switchover enabled	X1C	Near-zero point dog	Y1C	
X1D to X1F	· Used only when AD70 is used as remote I/O station. · Interlock signals for PFRP, RTOP instructions	Y1D	PLC ready	X1D	Stop (external stop signal)	Y1D	
		Y1E	Not used	X1E	Upper limit LS	Y1E	
		Y1F		X1F	Lower limit LS	Y1F	
				X20 to X2F	Not used	Y20	Zero return start
						Y21	Absolute positioning start
						Y22	Forward start (in the incremental mode and velocity/position control switchover mode)
						Y23	Reverse start (in the incremental mode and velocity/position control switchover mode)
						Y24	Forward JOG start
						Y25	Reverse JOG start
						Y26	Velocity/position mode re-start
						Y27	Stop
						Y28	Error reset
						Y29	Overflow reset
						Y2A	Underflow reset
						Y2B	Not used
						Y2C	Velocity/position switchover enabled
						Y2D	PLC ready
						Y2E	Not used
						Y2F	

(d) Buffer memory address comparison

No special differences are identified.

11 EXTERNAL DIMENSIONS

11.1 Large-sized A/QnA Series External Dimensions and Mounting Dimensions
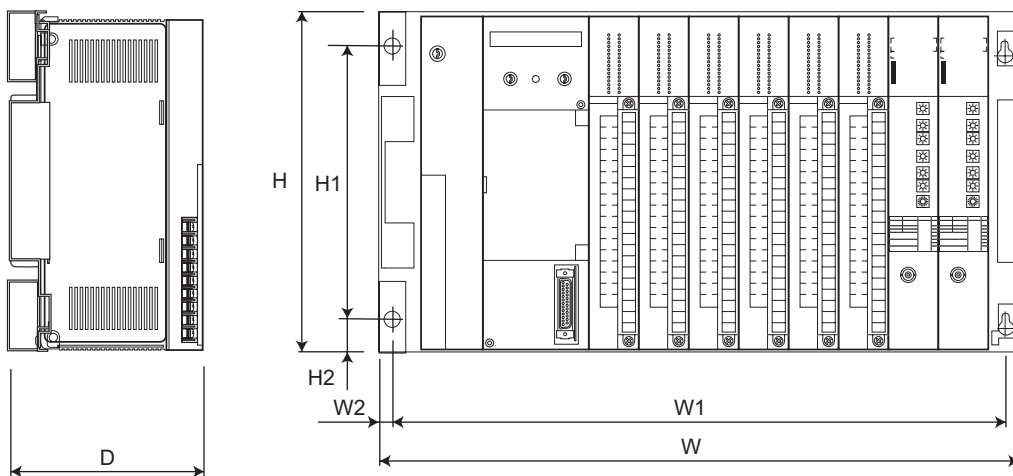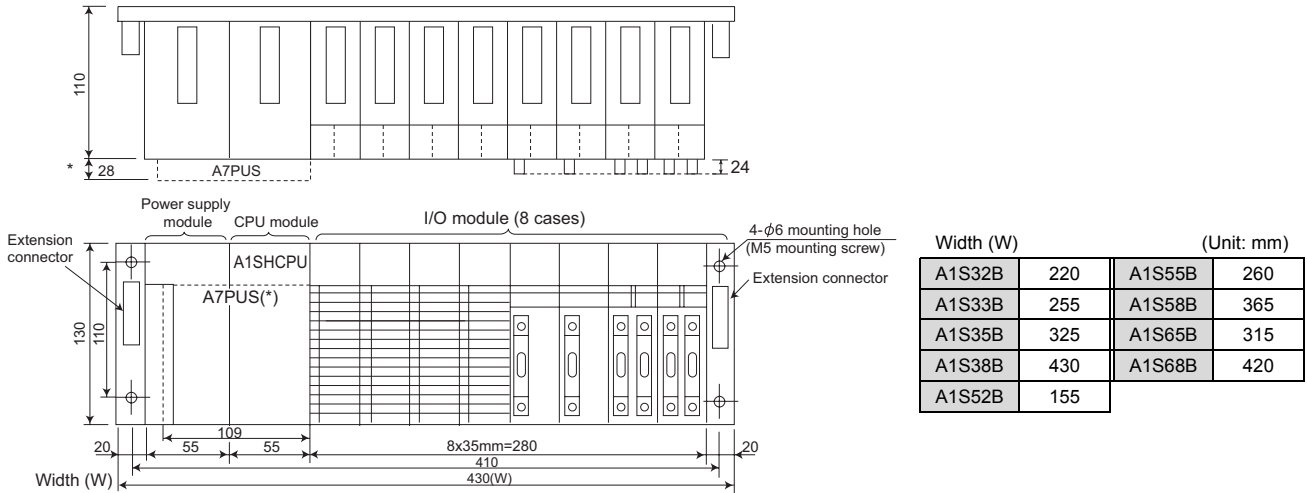

Unit: mm

Base unit	Dimensions			Dimensions for mounting			
	H	W	D*1	H1	H2	W1	W2
A32B		247				227	
A32B-S1		268				248	
A35B		382				362	
A38B		480				460	
A38HB		480				460	
A38HBEU		480				460	
A32RB		494				474	
A33RB	250	570	130*2	200	25	550	10
A37RHB		497				477	
A52B		183				163	
A55B		297				277	
A58B		411				391	
A62B		238				218	
A65B		352				332	
A68B		466				446	
A68RB		522				502	

*1   D (depth) varies depending on the module to be mounted. Therefore, confirm the external dimensions of each module.

*2   For mounting A series module of which depth is 121mm.

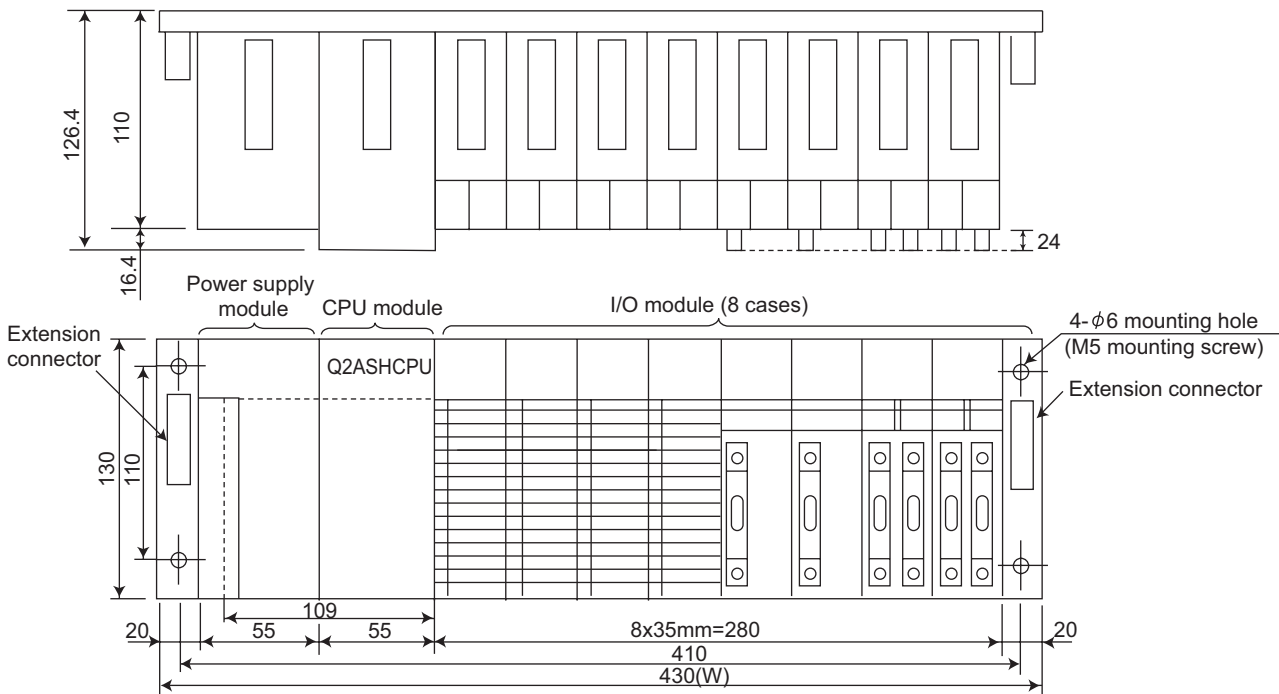## 11.2 Small-sized AnS/Q2AS Series External Dimensions and Mounting Dimensions

(1) A1SH, A2SH, A2AS, A2AS-S1, A2USH-S1

Width (W)			(Unit: mm)
A1S32B	220	A1S55B	260
A1S33B	255	A1S58B	365
A1S35B	325	A1S65B	315
A1S38B	430	A1S68B	420
A1S52B	155		

* When A7PUS is mounted

* A memory cassette is installed from the front face for A2AS(-S1) and A2USH-S1 and the left face for A1SH and A2SH.

(2) Q2AS

Width (W)								(Unit: mm)
A1S32B	A1S33B	A1S35B	A1S38B · A1S38HB · A1S38HBEU	A1S52B	A1S55B	A1S58B	A1S65B	A1S68B
220	255	325	430	155	260	365	315	420

* For the base unit, A1S38B is used as an example.

APPENDICES

Appendix 1 Spare Parts Storage

(1) **The general specifications of PLCs are as follows. Please do not store spare parts under a high temperature or high humidity condition, even within the range guaranteed by the specifications.**

Storage ambient temperature	-20 to 75℃
Storage ambient humidity	10 to 90%, no condensation

(2) **Store in a place avoiding direct sunlight.**

(3) **Store under a condition with no dust or corrosive gas.**

(4) **The battery capacity of a A6BAT battery or a lithium-coin battery (commercially available) for memory card will be decreased by its self-discharging even when it is not used. Replace it with new one in 5 years as a guideline.**

(5) **Among power supply modules or CPU modules with built-in power supply that use any aluminum electrolytic capacitor, the characteristics of the modules listed below will be deteriorated if they are left un-energized for a long time. Therefore, take the following measures.**

Product	Model
CPU module (Power supply module built-in type)	A1NCPU, A1NCPUP21, A1NCPUR21, A1NCPUP21-S3 A2CCPU, A2CCPUP21, A2CCPUR21, A2CCPUC24 A2CCPUC24-PRF
Power supply module	A61P, A61PEU, A61P-UL, A62P, A62PEU, A63P, A68P A61RP, A67RP, A2CJ66P

[Measures for preventing aluminum electrolytic capacitor characteristics deterioration]
Once every 2 or 3 years, increase the voltage gradually from 0V to the rated voltage spending 10 minutes or more and keep the voltage for several hours to activate the aluminum electrolytic capacitor. Or, rotate products at the periodic inspection (in every 1 to 2 years).

[Reference]
The life of an aluminum electrolytic capacitor, even if not used and under a normal temperature, decreases approximately 4 times slowly than the case when it is energized.

Appendix 2 Related Manuals

Appendix 2.1 Replacement Handbooks

No.	Manual name	Manual No.	Model name code
1	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Fundamentals)	L-08043ENG	—
2	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Intelligent Function Modules)	L-08046ENG	—
3	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Network Modules)	L-08048ENG	—
4	Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Communications)	L-08050ENG	—
5	Transition from MELSEC-A0J2H Series to Q Series Handbook	L-08060ENG	—
6	Transition from MELSECNET/MINI-S3,A2C(I/O) to CC-Link Handbook	L-08061ENG	—
7	Transition from MELSEC-I/OLINK to CC-Link/LT Handbook	L-08062ENG	—
8	Transition from MELSEC-A/QnA Large Type Series to AnS/Q2AS Small Type Series Handbook	L-08064ENG	—

Appendix 2.2 Large-sized A/QnA Series

No.	Manual name	Manual No.	Model name code
1	MELSEC-A/QnA Catalog	L-08033E	—
2	MELSEC-A/QnA Data Book	L-08029E	—
3	Type A1N/A2N(S1) / A3NCPU User's Manual	IB-66543	13JE83
4	Type A2A (S1) / A3ACPU User's Manual	IB-66544	13JE84
5	Type A2U (S1) / A3U/A4UCPU User's Manual	IB-66436	13JE25
6	Q2ACPU (S1) / Q3ACPU/Q4ACPU User's Manual	IB-66608	13J821
7	Type A2CCPU (P21/R21), A2CCPU-DC24V, A2CCPUC24 (-PRF), A2CJCPU User's Manual	IB-66545	13JE85
8	Type ACPU/QCPU-A (A Mode) (Fundamentals) Programming Manual	IB-66249	13J740
9	Type ACPU/QCPU-A (A Mode) (Common Instructions) Programming Manual	IB-66250	13J741
10	Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions)	IB-66251	13J742
11	Type AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (PID Control Instructions)	IB-66258	13J744
12	Type MELSAP-II(SFC) Programming Manual	IB-66361	13JF40
13	QnACPU Programming Manual (Fundamentals)	IB-66614	13JF46
14	QnACPU Programming Manual (Special Function Module)	SH-4013	13JF56
15	QCPU(Q Mode)/QnACPU Programming Manual (Common Instructions)	SH-080039	13JF58
16	QCPU(Q Mode)/QnACPU Programming Manual (PID Control Instructions)	SH-080040	13JF59
17	QCPU(Q Mode)/QnACPU Programming Manual (SFC)	SH-080041	13JF60
18	I/O module type Building block User's Manual	IB-66140	13J643
19	A/D converter module type A68AD User's Manual	IB-66054	13J607
20	A/D converter module type A68AD-S2 User's Manual	IB-66213	13J647
21	Analog-Digital Converter Module type A68ADN User's Manual	IB-66307	13J668
22	Analog-Digital Converter Module type A616AD User's Manual	IB-66171	13J645
23	D/A converter module type A62DA User's Manual	IB-66053	13J608
24	D/A converter module type A62DA-S1 User's Manual	IB-66177	13J648
25	Digital-Analog Converter Module type A68DAV/DAI(S1) User's Manual	IB-66285	13J667
26	Digital-Analog Converter Module type A616DAV User's Manual	IB-66172	13J650
27	Digital-Analog Converter Module type A616DAI User's Manual	IB-66173	13J651
28	Pt100 input module type A68RD3/4 User's Manual	IB-66308	13J670
29	Type A68RD3N/4N, A1S62RD3N/4N Pt100 Input Module User's Manual	SH-080193	13JR46
30	Temperature-Digital Converter Module type A616TD User's Manual	IB-66174	13J654
31	High speed counter module type AD61(-S1) User's Manual	IB-66052	13J610
32	Positioning module type AD70 User's Manual	IB-66309	13J663
33	Positioning Module Type AD72 User's Manual	IB-66095	13J622
34	A1SD75P1-S3/P2-S3/P3-S3/AD75P1-S3/P2-S3/P3-S3 Positioning Module User's Manual	IB-66716	13J871
35	Positioning module type A1SD75M1/M2/M3, AD75M1/M2/M3 User's Manual	IB-66715	13J870
36	Type MELSECNET, MELSECNET/B Data Link System Reference Manual	IB-66350	13JF70
37	Control & Communication Link System Master/Local Module Type AJ61BT11/A1SJ61BT11 User's Manual	IB-66721	13J872
38	For A Ethernet Interface Module User's Manual	SH-080192	13JR45
39	For QnA Ethernet Interface Module User's Manual	SH-080146	13JR33
40	Computer Link Module (Com.link func./Print. func.) User's Manual	SH-3511	13JF77
41	Serial Communications Module User's Manual (Modem Function Additional Version)	SH-66612	13J825
42	Intelligent Communication Module type AD51-S3 User's Manual	IB-66189	13J655

No.	Manual name	Manual No.	Model name code
43	Intelligent communication module type AD51H-S3 User's Manual	IB-66401	13JE16
44	MELSECNET/MINI-S3 Master Module Type AJ71PT32-S3, AJ71T32-S3, A1SJ71PT32-S3, A1SJ71T32-S3 User's Manual	SH-66565	13JE64
45	MELSEC-I/O LINK Remote I/O System Master Module type AJ51T64/A1SJ51T64 User's Manual	SH-66574	13J748
46	Type MELSECNET/10 Network system (PLC to PLC network) Reference Manual	IB-66440	13JE33
47	For QnA/Q4AR MELSECNET/10 Network System Reference Manual	IB-66690	13JF78
48	Control & Communication Link System Master/Local Module type AJ61QBT11/A1SJ61QBT11 User's Manual	IB-66722	13J873
49	Positioning Module Type AD71(S1/S2/S7)/A1SD71-S2(S7) User's Manual	IB-66563	13JE98
50	PC fault detection module type AS91, A1SS91, A0J2-S91 User's Manual	IB-66626	13J828

Appendix 2.3 Small-sized AnS/Q2AS Series

No.	Manual name	Manual No.	Model name code
1	Type A2USHCPU-S1 User's Manual	IB-66789	13JL30
2	Model Q2AS (H) CPU (S1) User's Manual	SH-3599	13J858
3	Type ACPU/QCPU-A (A Mode) Programming Manual (Fundamentals)	IB-66249	13J740
4	Type ACPU/QCPU-A (A Mode) Programming Manual (Common Instructions)	IB-66250	13J741
5	Type AnSHCPU/AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (Dedicated Instructions)	IB-66251	13J742
6	Type AnACPU/AnUCPU/QCPU-A (A Mode) Programming Manual (PID Control Instructions)	IB-66258	13J744
7	Type MELSAP-II (SFC) Programming Manual	IB-66361	13JF40
8	QnACPU Programming Manual (Fundamentals)	IB-66614	13JF46
9	QnACPU Programming Manual (Special Function Module)	SH-4013	13JF56
10	QCPU (Q Mode)/QnACPU Programming Manual (Common Instructions)	SH-080039	13JF58
11	QCPU (Q Mode)/QnACPU Programming Manual (PID Control Instructions)	SH-080040	13JF59
12	QCPU (Q Mode)/QnACPU Programming Manual (SFC)	SH-080041	13JF60
13	AnS Module type I/O User's Manual	IB-66541	13JE81
14	Analog-Digital Converter Module type A1S68AD User's Manual	IB-66576	13J757
15	D/A converter module type A1S62DA User's Manual	IB-66335	13J673
16	Thermocouple input module type A1S68TD User's Manual	IB-66571	13J781
17	Digital-Analog Converter Module type A1S68DAV/DAI User's Manual	IB-66587	13J810
18	Pt100 input module type A1S62RD3/4 User's Manual	IB-66338	13J675
19	High speed counter module type A1SD62, A1SD62E, A1SD62D(S1) User's Manual	IB-66593	13J816
20	Positioning module type A1SD70 User's Manual	IB-66367	13JE04
21	Positioning module type A1SD75M1/M2/M3, AD75M1/M2/M3 User's Manual	IB-66715	13J870
22	A1SD75P1-S3/P2-S3/P3-S3, AD75P1-S3/P2-S3/P3-S3 Positioning Module User's Manual	IB-66716	13J871
23	Type A1S62LS User's Manual	IB-66647	13J837
24	Type A1SD51S Intelligent communication module User's Manual	IB-66551	13JE90

Appendix 2.4 Programming Tool

No.	Manual name	Manual No.	Model code
1	GX Developer Version 8 Operating Manual	SH-080373E	13JU41
2	GX Developer Version 8 Operating Manual (SFC)	SH-080374E	13JU42
3	GX Simulator Version 7 Operating Manual	SH-080468ENG	13JU51
4	Type SW4IVD-GPPA (GPP) Operating Manual	IB-66855	13JL62

Memo

WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
    1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
    2. Failure caused by unapproved modifications, etc., to the product by the user.
    3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
    4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
    5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
    6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
    7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
    Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
(2) The Mitsubishi programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable logic controller applications.
In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable logic controller range of applications.
However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

Mitsubishi Programmable Logic Controller

MITSUBISHI ELECTRIC CORPORATION

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Specifications subject to change without notice.